

**DRAFT
ENVIRONMENTAL IMPACT STATEMENT**

For

**KOLOA - POIPU REGIONAL
WASTEWATER RECLAMATION FACILITY
PROJECT**

Koloa, Kauai, Hawaii



Prepared For:
HOH Utilities, LLC

Prepared By:



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WASTEWATER RECLAMATION
FACILITY PROJECT**

KŌLOA, KAUA'I, HAWAII

AUGUST 2009

**This document was prepared pursuant to the requirements
of Chapter 343, Hawaii Revised Statutes.**

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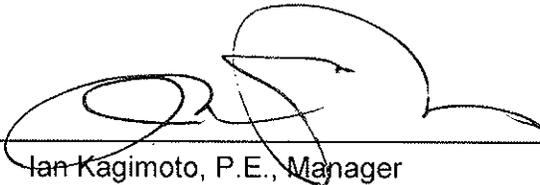


Draft
Environmental Impact Statement

For

Kōloa-Po'ipū Regional Wastewater Reclamation Facility Project
Kōloa, Kaua'i, Hawaii

This Draft Environmental Impact Statement and all ancillary documents were prepared under the signatory's direction or supervision, and the information submitted, to the best of the signatory's knowledge, fully addresses document content requirements as set forth in sections 11-200-17 and 11-200-18, Hawaii Administrative Rules, as applicable.



Ian Kagimoto, P.E., Manager
HOH Utilities, LLC

8/7/09

Date

PREFACE

This Environmental Impact Statement Preparation Notice is prepared pursuant to Chapter 343, Hawai'i Revised Statutes, and Title 11, Chapter 200, Administrative Rules, Department of Health, State of Hawai'i. HOH Utilities, LLC, the Applicant, proposes to develop a private regional wastewater reclamation facility and collection system in the Kōloa-Po'ipū area within the south shore area of the Island of Kaua'i. The County of Kaua'i, Planning Department is the Accepting Authority and has determined that the proposed action requires the preparation of an Environmental Impact Statement.

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- Appendix G Phase I Environmental Site Assessment Report Propose Poipu Wastewater Treatment Plant Property at Former Koloa Mill, Mahaulepu Road, Koloa, Hawaii, TMK (4) 2-9-001:001, TMK (4) 2-9-002:001 and 999. Myounghee Noh & Associates, July 1, 2009
- Appendix H Air Quality Study for the Proposed Koloa-Poipu Regional Wastewater Reclamation Facility Project B.D. Neal and Associates February 2009
- Appendix I Noise Impact Assessment Report, Koloa-Poipu Wastewater Reclamation Facility Project , Koloa/Poipu, Kauai, Hawaii. D.L. Adams Associates, LTD. March 2009

EXECUTIVE SUMMARY

DESCRIPTION OF THE ACTION

HOH Utilities, LLC, a State Public Utilities Commission (PUC) regulated utility company, is proposing to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region. The proposed Regional Wastewater Reclamation Facility (Regional WRF) and collection system is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.

The need for the proposed Project is to provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in the south shore area extending from Kōloa Town to Po'ipū, and Kukui'ula. The proposed Regional WRF is intended to treat wastewater at a tertiary level that will result in R-1 quality effluent water that can be reused for beneficial applications. The R-1 water, as prescribed under DOH, is the highest level of treated wastewater. Accordingly, these wastewater infrastructure improvements would address the multiple problems plaguing wastewater collection and treatment in the south shore area, including: replacing large capacity cesspools, replacing aging on-site package plants, providing an alternative for businesses and homeowners currently relying on cesspools or septic systems, providing a wastewater alternative for proposed new developers, and generating high-quality effluent that would be available for beneficial reuse.

The proposed Regional WRF will be situated within an agricultural area utilizing a portion of the existing Kōloa Mill site (TMK: (4) 2-09-001: portions of 001 and 002). In consideration of the historic character and nature of the Mill site, the design of the buildings associated with the Regional WRF will emulate the architectural characteristics of the Mill to the extent possible.

The wastewater collection system improvements proposed to serve the Regional WRF will consist of three systems identified as: 1) Kōloa Collection System; 2) Po'ipū Collection System; and 3) Eastern Collection System. Improvements associated with these collection systems include development of four (4) WWPSs along with the following:

- The Kōloa Collection System improvements would include approximately 8,000 linear-feet of sewer lines and a new Kōloa Town WWPS to service areas within Kōloa Town. The Kōloa WWPS is proposed to be located on an underdeveloped parcel situated along Weliweli Road near its intersection with Waikomo Road (TMK: 2-08-011: portion of 001);
- The Po'ipū Collection System improvements include the development of two (2) new WWPSs (Villages and Crater) gravity lines and force main. This collection system will convey flows from the existing Po'ipū WRF situated along Po'ipū Road.

The proposed Villages WWPS will be located within an undeveloped site just mauka of the existing Kiahuna Swim and Tennis Club facility (TMK: (4) 2-08-014: portion of 019) while the proposed Crater WWPS will be located within an undeveloped site east of the existing water tanks near Puuhi Reservoir (TMK: (4) 2-09-001: portion of 001); and

- The Eastern Collection System improvements include the development of the Eastern WWPS gravity lines and force main. It would be used to convey wastewater flows generated from existing and future developments located in the Po'ipū area; including the Grand Hyatt Kaua'i Resort and Spa. The Eastern WWP will be located within an undeveloped site located east of the Po'ipū Bay Golf Course and mauka of the private road that extends eastward from Po'ipū Road (TMK: (4) 2-09-001: portion of 001).

The new Regional WRF facility is planned to treat excess wastewater from the Po'ipū WRF along with its waste activated sludge, and wastewater from other residential and commercial developments within the Kōloa Town and Po'ipū service areas.

The Regional WRF will be developed in phases based on demand for wastewater treatment. The first phase of the facility is scheduled for completion in 2010. It will be designed for a 0.6 mgd average daily flow (ADF). The second phase of the facility which is scheduled for completion by 2015 will expand the capacity to about 1.1 mgd ADF. Beyond 2020 the demand for new wastewater treatment capacity will be dependent upon the connection of existing developments located in the Po'ipū area east of Weliweli Tract. Should these existing developments connect to the Regional WRF, the facility would be expanded to a capacity of approximately 1.7 mgd ADF.

Significant Beneficial and Adverse Impacts and Proposed Mitigation Measures

Drainage/Flood Control/Water Quality/Soil Erosion. All grading operations will be conducted in accordance with dust and erosion control and other requirements of the County of Kaua'i Grading Ordinance. All construction activities must comply with the relevant provisions regulating Fugitive Dust set forth under Section 11-60.1-33, Hawai'i Administrative Rules (HAR). A grading permit is required to modify the topography, and additionally, and National Pollutant Discharge Elimination System (NPDES) permit will be required prior to construction to address non-point source discharges. Potential impacts to water quality due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The use of PVC pipe will provide for corrosion resistance and longevity, and is more durable and resistant to breakage. Standard procedure for detecting leaks and breaks and for shutting down and repairing the collection system will further minimize impacts. The potential for wastewater spills impacting water quality during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The proposed regional collection and treatment system would have a beneficial impact on water quality since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs and would allow for these existing systems to be phased out over time and result in the closure of their associated injection wells.

Natural Hazards. Potential damage to the Regional WRF and associated collection system improvements (pump stations and sewer lines) may occur from earthquake, hurricane, tsunami and flooding hazards. However, damages to these structures will be mitigated and minimized by complying with appropriate State and County design standards and requirements. Thus, the risk of potential damage to the proposed project will not be more than other existing land uses or infrastructure facilities on the island.

Botanical Resources. No listed species (USFWS, 2005, 2009a) were encountered and none is expected to occur in the areas subject to disturbance by the proposed project owing to the fact that nearly all of the routes proposed for the project pass through very disturbed vegetation or where the vegetation has been disturbed in previous decades with re-growth strongly favoring non-native invasive species.

Avifauna, Mammal, and Invertebrate Resources. An ornithological, mammalian, and invertebrate survey of the Project Area was conducted.

One endemic species of avifauna, the Hawaiian Goose (Nene), and two indigenous species, the White-tailed Tropicbird and the Pacific Golden-Plover, were detected in the project area. The Regional WRF project should not have a significant impact on these three avian species since the sewer collection system would consist of underground sewer lines generally located along roadways that would not affect these avian species and the pump stations planned should not affect these avian species since the majority of the pump station equipment would be underground. Only some equipment would be located above ground, and these pump stations would not be sited within or next to areas of importance that are used by these species. There is a possibility that the infiltration pond could occasionally be visited by waterbirds present in the area because such ponds are essentially creating habitat that may be used by these species. However, it not expected to negatively impact such species.

Although not detected during the survey, it is probable that the Hawaiian endemic sub-species of the Short-eared Owl (Pueo or *Asio flammeus sandwichensis*) use resources in the general project area. Also, two other species not detected during this survey, the Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened endemic sub-species of the Newell's Shearwater (*Puffinus auricularis newelli*), have been recorded over-flying the project site. The petrel is listed as endangered, and the shearwater as threatened under both Federal and State of Hawai'i endangered species statutes.

Construction of the project is not anticipated to impact Hawaiian Petrels and Newell's Shearwaters because such activities would be conducted during the day. Thus, construction activities would not occur at night or involve the use of exterior lightning that may affect flying seabirds. The wastewater pump stations and the operation of the proposed treatment facility should not have activities occurring at night and no street lighting would be associated with this facility. Special attention will be paid to any outside lighting incorporated into the design of building structures at the treatment facility to reduce the potential for interactions of nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures.

Construction of the Regional WRF project and collection system improvements along with the operation of the treatment facility are not expected to result in a deleterious or significant impacts to native mammalian resources present within the general project area. The majority of mammals detected or likely present in the area were introduced species such as rodents, feral cats, dogs, pigs, etc. which are generally detrimental to the remaining native ecosystems.

While not detected during the survey, the Hawaiian hoary bat has been found within the Project Area. Construction of the project and the project itself is not expected to have a significant impact on bats since the present habitat at the Kōloa Mill site and the sewer line corridors is not of the type or general vegetation makeup that one would ordinarily expect to find bats foraging in.

While no subterranean invertebrate study was done for the Project Area, the area has been known to be home to the Kaua'i cave wolf spider and the Kaua'i cave amphipod. The only probable impact to subterranean invertebrate species would occur during construction activities. The operation of the treatment facility and collection system would not affect subterranean invertebrate species. Therefore, only short-term construction activities for the proposed improvements may impact such species.

If a lava tube or cave is broken into during construction activities, a survey of that void will need to be conducted immediately. A set of lava tube/cave break-in guidelines and procedures will be prepared prior to the initiation of construction activities to ensure that impacts to any archaeological, cultural or natural resource components potentially present is minimized to the maximum extent practicable.

Archaeological Resources. An archaeological inventory survey prepared for the proposed Project Area will be submitted to the State Historic Preservation Division (SHPD) in fulfillment of Sections 13-284 and 13-276, HAR.

The inventory survey identified three historic properties within the southwestern portion of the project area. All three historic properties (SIHP -954, -955, and -992) were previously identified. SIHP #50-30-10-955, a pre-contact habitation platform and SIHP #50-30-10-992, a post contact dirt road with parallel stacked stone boundary walls, was recommended eligible to the Hawai'i State Register. No further historic preservation work was recommended for SIHP

#50-30-10-954, a pre-contact habitation enclosure, terrace, and platform, and SIHP #50-30-10-955.

It is also recommended that a cultural resource preservation plan in accordance with Title 13-277-3, HAR be prepared to address buffer zones and protective measures for SIHP #50-30-10-992 as well as two other sites located in the vicinity of the Po'ipū Collection System project corridor; SIHP #50-30-10-947 (post-contact railroad berm) and SIHP #50-30-10-953 (pre-contact probable burial platform). Additionally it is likely that subsurface historic properties may be present within the makai (seaward) portion of this corridor, therefore, it is recommended that project construction proceed under an archaeological monitoring program.

Architectural Resources. A historical architectural survey was completed for the Kōloa mill site of the proposed project. Of the buildings located on the property, the sugar mill building, water pump sheds, sugar bins, sugar storage building, molasses and day storage tanks, and cleaning plant foundations are over 50 years old and appear to meet the criteria for listing in the Hawai'i and National Registers of Historic Places.

Of the mill's buildings and structures, only the bagasse storage building and water tank would be directly included as part of the proposed wastewater treatment facility. Therefore, the project will have no direct effect upon historic. Retaining and reusing the water tank and bagasse storage building, will allow the sugar mill complex to remain intact. However, the reuse of these two components may have an indirect effect by introducing a new function as well as new visual and atmospheric elements to the complex, thereby reducing its integrity with regards to setting, feeling, and associations.

To mitigate any indirect effects on the Kōloa Mill, additional digital photographs documenting the water tank and bagasse storage building should be taken and provided to the SHPD. A copy of the original drawings of the bagasse storage building's conveyor system, which are presently held by Grove Farm Plantation, should also be provided to the SHPD.

Cultural Resources. Several of the consulted participants expressed concern that the proposed project may negatively impact Hawaiian and Kōloa community members' beliefs, resources, and practices. Based upon evaluation of the comments and concerns expressed by the individuals, it appears that many of the issues raised concern prior events associated with the history of the region, County related land use policies, and other factors beyond the control and jurisdiction of the Applicant concerning this project. Other issues could be addressed by implementing appropriate mitigative measures which are discussed in other sections.

It is possible that there are human skeletal remains as well as significant cultural and historic properties in the project area that could be affected. Based upon the archaeological inventory survey, significant historic properties identified were mainly associated with the Po'ipū Collection System route, and proposed mitigative measures include: 1) a cultural resource preservation plan to address buffer zones and protective measures for SIHP #50-30-10-992

(Hapa Road), SIHP #50-30-10-947 (post-contact railroad berm), and SIHP #50-30-10-953 (pre-contact probable burial platform); and 2) an archaeological monitoring program implemented prior to construction that will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered.

To address community concerns with working to solve past planning problems, the Applicant has consulted with the community by giving presentations to community associations and will continue consulting with the community to keep them apprised of this project and progress. They will also seek assistance from the community when dealing with cultural issues as appropriate.

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

After project construction, long-term impacts to noise can result from the pumps, blowers, and emergency generators stalled at the treatment facility. The four (4) wastewater pumping stations will also incorporate stationary and non-stationary mechanical equipment to convey the flow of wastewater to the Regional WRF. The emergency generators will be the loudest equipment installed at the facilities and must meet the State noise rules during monthly testing. Submersible pumps and blowers will also be a source of noise at the WWPSs and must meet the State noise rules.

The design of the wastewater reclamation facility along with the pump stations will give consideration to controlling noise emanating from mechanical equipment so as to comply with the State Department of Health Community Noise Control rules.

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

After project construction, long-term impacts to air quality can result from odor issues associated with wastewater treatment facilities. This project's design intention is to put as many of the treatment tanks as possible inside the existing bagasse building. Further, any tanks located outside will be covered and the off-gas treated with an odor control system. It is expected that enclosing many of the tanks in the bagasse building and covering and treating

any outdoor tanks will substantially eliminate any nuisance odor issues associated with the facility. Odor control systems will also be provided at wastewater pump station sites.

Transportation. Construction of the wastewater pump stations would not affect County roadways because they would be located within privately-owned property. The minor impacts on County roadways affected would involve temporary additional congestion to traffic resulting from the rerouting of traffic. However, the rerouting or temporary lane closures would not occur during the weekday morning and afternoon peak commuter periods where traffic volumes are heavier and one lane of traffic shall be maintained at all times during construction and all lanes opened to public and pedestrian traffic during non-working hours.

Visual Resources. The treatment facility improvements are expected to have minimal if any impact on views of the scenic landforms of the Haupu Mountains and Puu Hunihuni. Most of the facility equipment would be located within the existing bagasse building and an existing water tank will be used. Other equipment and structures developed at the site would not be large or tall as the remaining mill structures.

Views of the scenic landforms from Ala Kinoiki Road would not be impacted by the project because the facilities would not be visible from this roadway. In consideration of the historic character and nature of the existing Kōloa Mill, the design of the building structures associated with the Regional WRF will emulate the architectural characteristics of the Mill to the extent possible.

Infrastructure/Public Facilities/Utilities. The project should not affect the County DOW's existing water facilities since the Project would produce R-1 quality effluent to be used for reuse as part of the Po'ipū Bay Golf Course. The Regional WRF Project will not impact County wastewater facilities because there are no facilities presently serving this area. The Regional WRF project should only have minor impacts on existing drainage facilities and drainage patterns since the majority of improvements would be located underground and thus not affect existing drainage patterns in the area or drainage facilities. During design and construction of the proposed wastewater system improvements, coordination will be conducted with the County Department of Public Works and the respective landowners. The Regional WRF project should have minimal impact on existing electrical, communication, and cable TV providers or their infrastructure facilities since the sewer collection lines will not require services from these utility companies, the pump stations would only require electrical service, and the regional treatment facility would require electrical service and communication service. Prior to construction of the proposed wastewater system improvements, the construction contractor(s) will also be responsible for verifying the location and depth of all existing electrical utilities within the affected areas to ensure that functions of the utilities are not impacted or impeded.

Construction of the project will generate solid waste typical of normal construction related activities over a short time period. The contractor will be required to remove all debris from the site, and properly dispose them at the landfill in conformance with County regulations. Such

activities are expected to have a minor impact on County solid waste facilities. If necessary, a trash management and recycling program will be developed and implemented during construction activities to minimize impacts to the Kekaha Landfill.

Operation of the proposed Regional WRF will produce solid waste as a byproduct of the wastewater treatment and reclamation process and will be disposed of at the Kekaha Landfill. The disposal of solids should not significantly impact the County's landfill, and the disposal of these solids will be in compliance with pertinent State and County regulations.

Proposed improvements should not have any long-term impact on public facilities since this project would not result in direct or indirect changes to current and future resident and visitor populations in the region, and would thus not create additional demands or impacts on public facilities.

Socio-Economic. Construction of the Regional WRF Project should have a positive economic impact associated with the creation of short-term construction related jobs. The preliminary estimated construction costs for the project were projected to be approximately \$28.0 million; depending on the phasing implemented for the treatment plant and sewer collection improvements, construction jobs would be spread over several years. Also direct economic benefits will result from construction expenditures both through the purchase of material from local suppliers and through the employment of local labor, thereby stimulating that sector of the economy.

ALTERNATIVES CONSIDERED

Project Alternatives: Major alternatives to the proposed action include the following:

- No Action Alternative;
- Postponing Action Alternative; and
- Using the existing Po'ipū WRF site as an alternative location for the Regional WRF

Secondary Treatment Design Alternatives:

- Conventional Activated Sludge-Extended aeration;
- Sequencing Batch Reactor;
- Membrane Bioreactor; and
- Advanced Ecological Engineering Systems

COMPATABILITY WITH LAND USE PLANS AND POLICIES

The proposed project will generally conform with the various land use plans, policies, and regulatory controls, including, but not limited to, the Hawai'i State Plan, State Functional Plans, State Coastal Zone Management Program, and the County of Kaua'i General Plan, the Kōloa-Po'ipū -Kalaheo Development Plan, and the County of Kaua'i Comprehensive Zoning Ordinance and Zoning.

The proposed project is consistent with the respective State Urban District classification and the project's sewer collection system consisting of the sewer lines and wastewater pump stations is consistent with the State Agricultural District classification. However, the wastewater treatment facility is not identified as a permitted use within the State Agricultural District and therefore, a State Special Permit will be required for this regional treatment facility.

The proposed project is not consistent with the County's Comprehensive Zoning Ordinance and Zoning since private utilities and facilities are not outright permitted uses in the Residential, Agriculture, and Open Districts. Therefore, a County Use Permit will be required for the proposed wastewater system improvements located in the Residential, Agriculture, and Open Districts. Also, since a County Use Permit will be required, a County Class IV Zoning permit will also be required for the proposed Project improvements.

REQUIRED PERMITS AND APPROVALS;

The following is a list of permits and approvals which may be required prior to the construction and operation of the proposed project:

State of Hawai'i

Department of Health

- National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Associated with Construction Activity
- NPDES Permit for Dewatering
- NPDES Permit for Hydrotesting
- Noise Permit
- Air Quality Permit
- Underground Injection Control (UIC) Permit
- Wastewater Management Plan Permit
- Use of Recycled Water for Irrigation Permit

Department of Land and Natural Resources Historic Preservation Division

- Chapter 6E, HRS Historic Preservation

Office of Planning

- Coastal Zone Management (CZM) Program Consistency Review

County of Kaua'i

Planning Department

- Special Permit
- Use Permit
- Class IV Zoning Permit

Department of Public Works

- Road Permit

- Grading/Grubbing Permit
- Building Permit
- Excavation Permit
- Drainage Plan Approval

Department of Water

- Water and Water System Requirements
- Water Connection Approval

Utility Companies

- Utility Service Requirements
- Permit Regarding Work on Utility Lines

SUMMARY TABLE

Project:	Kōloa-Po'ipū Regional Wastewater Reclamation Facility
Applicant:	HOH Utilities, LLC 3560 Kōloa Road Kalāheo, Hawai'i 96741 Telephone: (808) 742-9784 Contact: Ian Kagimoto, P.E.
EIS Consultant:	Wilson Okamoto Corporation 1907 South Beretania Street, Suite 400 Honolulu, Hawai'i 96826 Telephone: (808) 946-2277 Contact: Ronald Sato, AICP
Accepting Authority:	County of Kaua'i, Planning Department
Project Location:	Kōloa and Po'ipū area of the south shore of the Island of Kaua'i
Tax Map Keys:	(4) 2-08-004: portion of 003, 2-08-008: portion of 001 and 036, 2-08-009: portion of 001, 2-08-011: portion of 001, 2-08-014: portions of 005, 019, 023, 030, and 037; 2-08-022: portions of 001, 011, 021, and 030; and 2-09-001: portions of 001 and 002.
Project Area:	Approximately 10.50 acres
Proposed Action:	<p>The proposed action consists of the development of a regional wastewater reclamation facility and collection system in the Kōloa-Po'ipū area within the south shore of Kaua'i, Hawai'i.</p> <p>A new Kōloa-Po'ipū Regional Wastewater Reclamation Facility (WRF) will be constructed on a portion of the former Kōloa Mill site to treat wastewater collected to produce R-1 quality recycled water. The Regional WRF also includes a system of wastewater collection systems identified as: 1) Kōloa Collection System; 2) Po'ipū Collection System; and 3) Eastern Collection System. This collection system includes new wastewater pump stations and gravity and force mains.</p>
Determination:	The Accepting Authority has determined that the proposed action requires the preparation of an Environmental Impact Statement, based on the significance criteria set forth in Chapter 200, Title 11, Administrative Rules of the State of Hawai'i Department of Health.
Existing Uses:	Kōloa Mill site, undeveloped land, roadways, and utility easements.

State Land Use

District Classification: Agricultural District and Urban District

Kaua'i General Plan

Designation: Residential Community, Resort and Agriculture

Special Management Area: The Project Area is not within the Special Management Area.

County Zoning District: Agriculture District (A), Open District (O), and Residential Districts (R-6 and R-20)

1.2. Purpose for Environmental Document

This Draft Environmental Impact Statement (Draft EIS) was prepared pursuant to Chapter 343, Environmental Impact Statements, Hawai'i Revised Statutes (HRS), as amended (State of Hawai'i, 2007), and Title 11, Chapter 200, (Environmental Impact Statement Rules) of the State Department of Health's Administrative Rules, as amended (State of Hawai'i, 1996). The environmental review process for the Project is required based upon the following triggers:

1. A wastewater treatment unit identified as the Regional WRF which includes the associated collection system is proposed (Section 343-5 (a) (9) (A), HRS); and
2. The use of County lands identified as Kōloa Road, Waikomo Road, Weliweli Road and Ala Kinoiki Road (Eastern Bypass Road) are proposed for a portion of the wastewater collection system (Section 343-5 (a) (1), HRS).

Due to the potential for this Project having a significant effect on the environment, a Draft EIS was prepared to fully assess impacts resulting from the planned improvements and to identify pertinent mitigative measures that should be implemented to avoid or minimize project-related impacts. This determination was based upon the results of an environmental assessment and EIS Preparation Notice (EISPN) prepared along with consultation with the County of Kaua'i (County), Planning Department.

Under the environmental review process, an EISPN was published in the November 8, 2008 issue of *The Environmental Notice* by the State Office of Environmental Quality Control. The 30-day comment period for that EISPN document ended on December 8, 2008. Copies of comment letters received and responses to them are included in Appendix A of this document.

1.3. Proposing Applicant and Accepting Authority

The proposed Project is considered an "Applicant Action" under the environmental review regulations because it is being initiated as a private action by HOH Utilities, LLC. Under the Chapter 200, HAR the definition of the "Applicant" means "any person who, pursuant to statute, ordinance, or rule, officially requests approval from an agency for a proposed action" (State of Hawai'i, 1996). As a result, HOH Utilities, LLC serves as the Applicant initiating preparation of the Environmental Impact Statement documents under these requirements.

The Authorized Agent responsible for the preparation and processing of the environmental documents on behalf of HOH Utilities, LLC is Wilson Okamoto Corporation. Contact information is provided in Table 1-1 along with other project related information. This Draft EIS has been prepared in accordance with the requirements of Chapter 343, HRS and Chapter 200, HAR to address and document the likely environmental impacts resulting from the proposed action.

Table 1-1: Summary Information	
Project Name:	Kōloa-Po'ipū Regional Wastewater Reclamation Facility Project
Proposing Applicant:	HOH Utilities, LLC 3560 Kōloa Road Kalāheo, Hawai'i 96741 Telephone: (808) 742-9784 Contact: Ian Kagimoto, P.E.
Authorized Agent	Wilson Okamoto Corporation 1907 S. Beretania Street, Suite 400 Honolulu, Hawai'i 93813 Telephone: (808) 946-2277 Contact: Ronald Sato, AICP
Accepting Authority:	Planning Department, County of Kaua'i 4444 Rice Street, Suite A473 Līhu'e, Kaua'i, Hawai'i 96766

The County Planning Department will serve as the “Accepting Authority” for the EIS document. Under the environmental regulations for applicant actions, the authority for requiring statements and for accepting any required statements prepared rests with the agency initially receiving and agreeing to process the request for an approval. A State Special Permit (less than 15 acres) will be required for this project which will be processed by the County Planning Department with the decision to be rendered by the County Planning Commission. In addition, consultation with the County Planning Department was conducted during the initiation of this project which confirmed their agreement to serve as the Accepting Authority for this document.

HOH Utilities, LLC and Aqua Engineers, Inc.

HOH Utilities, LLC is a Hawai'i based limited liability company. It is authorized by the State Public Utilities Commission to provide wastewater treatment services pursuant to its certificate of public convenience and necessity, granted in Decision and Order No. 17562, filed on February 25, 2000, in Docket No. 99-0343.

Aqua Engineers, Inc., which will be the operator of the Regional WRF, currently operates 24 wastewater treatment facilities, 10 water systems, and over 60 wastewater pump stations covering the islands of Kaua'i, Oahu, Maui, Lanai, and Hawai'i, making them one of the largest and most experienced firms in the industry in Hawai'i. They are also the current operator of three (3) R-1 wastewater treatment facilities in the State of Hawai'i producing the highest quality wastewater effluent.

Starting in 1981, Aqua Engineers, Inc. initially provided operation and maintenance services for the Po'ipū WRF, and subsequently expanded to provide design and engineering services. Since then, the company has expanded its operations and services to include providing treatment facilities on various islands, and presently has operation and maintenance contracts at over 50 facilities throughout the State.

2. PROJECT DESCRIPTION

2.1. PROJECT LOCATION AND VICINITY

The Project is located on the south shore of the Island of Kaua'i in the Kōloa District which has the second largest population on the Island. This district is comprised of several existing communities of which those directly affected by this Project are Kōloa Town and Po'ipū. The future planned community of Kukui'ula situated west of Po'ipū will also be affected by this Project. Figure 2.1 is a project location map that shows the project in relation to this south shore of the island. The Project Area covered under the EIS document thus includes the affected areas within the communities of Po'ipū and Kōloa described below.

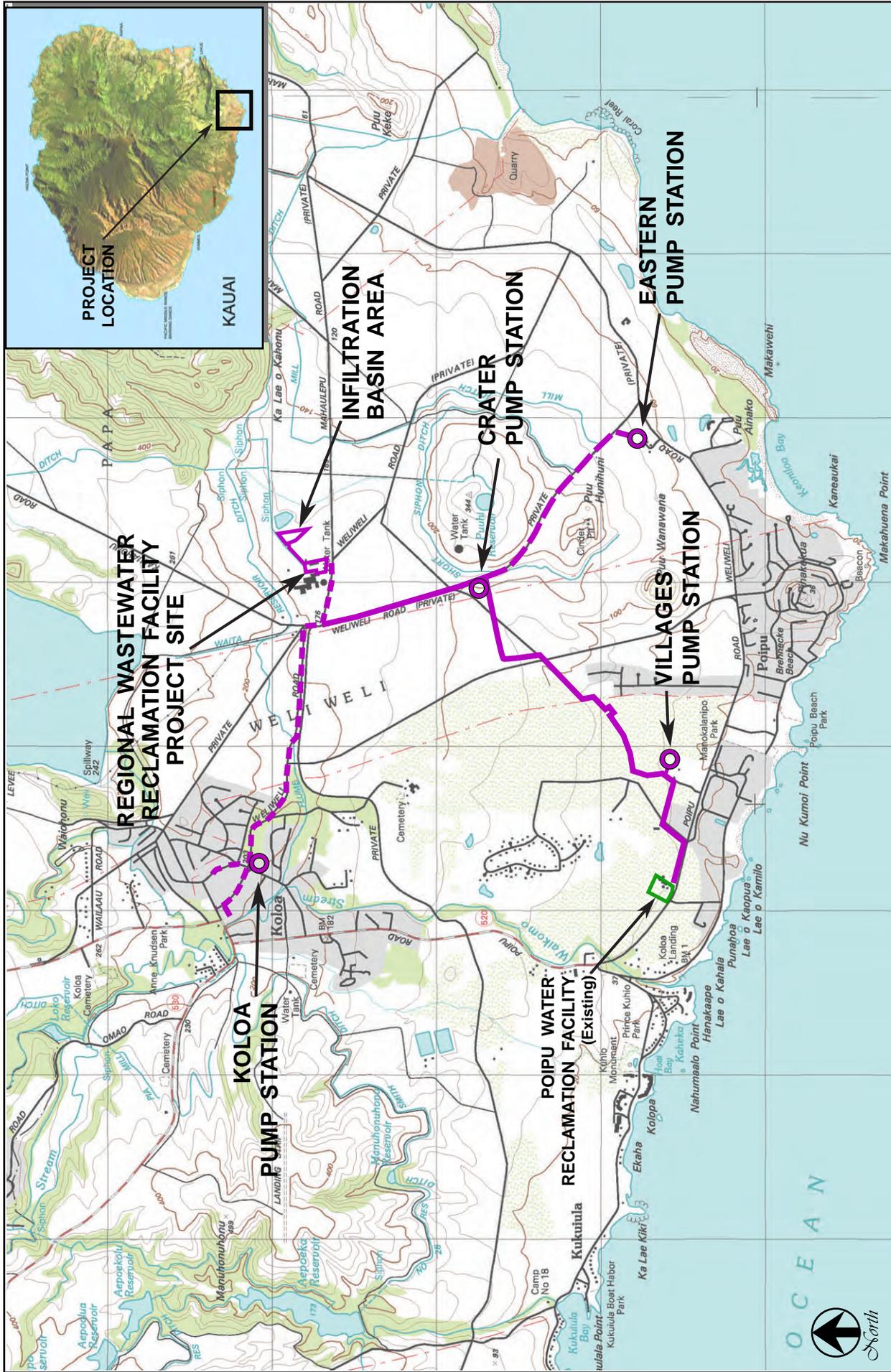
The State Department of Transportation's (DOT) Kaunualii Highway is generally routed in an east-west direction providing vehicular access from other regions of the island to this south shore area. From this highway, Maluhia Road (Highway 520) and Kōloa Road (Highway 530) provide access in a south (makai) direction toward Kōloa Town. Po'ipū Road (Highway 520) is a State highway providing access from Kōloa Road down to the coastline. Along the coastline, this highway then runs in a west to east direction. Lāwa'i Road is a County roadway that extends along the coastline in a east to west direction from Po'ipū Road.

Other major roadways providing vehicular access in this region are Ala Kinoiki Road (Po'ipū-Kōloa Bypass Road) and the recently completed Ala Kalanikaumaka Road. Ala Kinoiki Road provides vehicular access from Maluhia Road down to the coastline at Po'ipū Road. Ala Kalanikaumaka Road also provides vehicular access from Kōloa Road down to the coastline at Po'ipū Road. These roadways are shown on Figure 2-1.

The Kōloa community is located south (makai) of the residential communities of 'Ōma'o and Lāwa'i which are generally concentrated along Kaunualii Highway. Kōloa Town generally begins at the junction of the major roadways of Kōloa Road, Maluhia Road, and Po'ipū Road and extends southbound as shown on Figure 2-1. This town extends southbound along Po'ipū Road and encompasses the area eastbound from this road up to Ala Kinoiki.

The Po'ipū community is a resort-oriented community that is concentrated along the shoreline between Keoniloa Bay and the mouth of Waikomo Stream. Urban uses are generally developed from the shoreline inland up to Po'ipū Road which runs along the coastline in a west to east direction in this area. Newer residences extend further inland east of Po'ipū Road within the Kiahuna Golf Course.

West of Po'ipū and Kōloa Town is the planned community of Kukui'ula. This community would extend from the coastline inland (mauka) and from Po'ipū Road westbound generally up to a ravine and stream from the Aepeoka Reservoir as shown on Figure 2-1.



LEGEND:

- Koloa Collection System
- Po'ipu Collection System
- Eastern Collection System

Source:

State Office of Planning (USGS Map)
Aqua Engineers, Inc.

**FIGURE 2-1
PROJECT LOCATION MAP**

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC



2.1.1. Existing and Surrounding Uses

The proposed Regional WRF site is located at the site of the former Kōloa Mill. This mill is situated about one mile east outside of Kōloa Town in an area that is predominantly undeveloped consisting of mostly vacant agricultural land formerly used for plantation activities. Other project improvements consist of the sewer collection system which runs eastbound from this WRF site to service Kōloa Town and southbound to Po'ipū to service those areas. Figure 2-2 shows the existing and surrounding uses in the vicinity of the mill site along with areas proposed for the sewer collection system. Greater discussion of these existing uses is provided and photos of these areas are included in Appendix B of this document.

Kōloa Mill Site

The Kōloa Mill site is situated across two large privately-owned properties identified as TMK No. 2-09-001: portion of 001, and 2-09-002: portion of 001. This site consists predominantly of abandoned structures associated with the former Kōloa Mill (see Exhibit 2-1). The mill site is located at the eastern terminus of the County's Weliweli Road as shown on Figure 2-2.

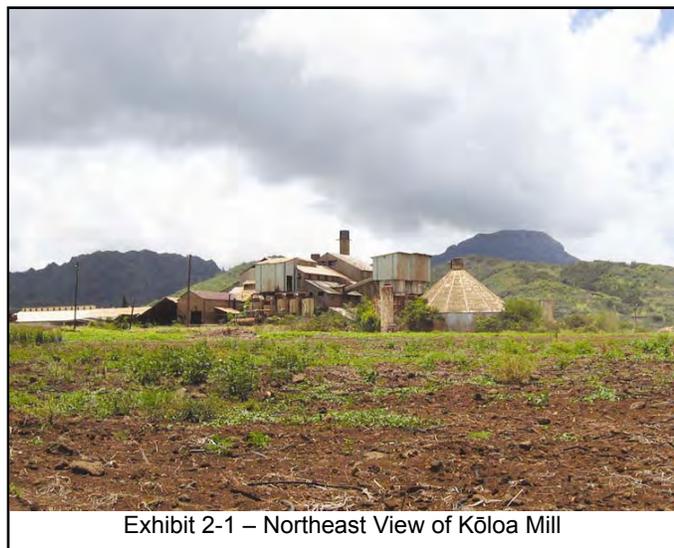
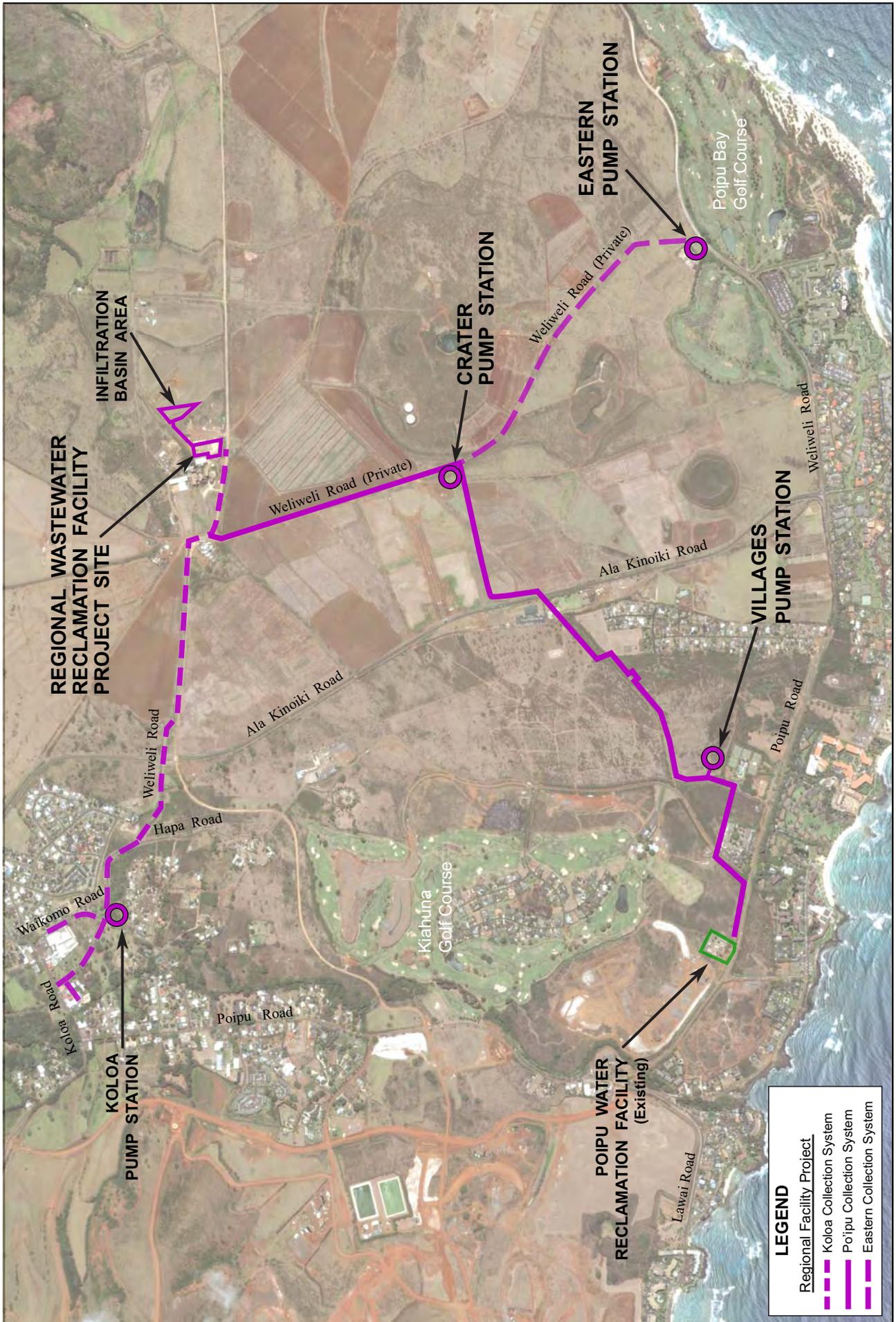


Exhibit 2-1 – Northeast View of Kōloa Mill

It should be noted that the project's Kōloa Mill site is an entirely separate and different sugar mill from the other historic "Old Sugar Mill of Kōloa" that is situated at the junction of Maluhia Road with Kōloa Road within the town of Kōloa. That historic mill is situated within property identified as TMK 2-08-006: 001, has a State historic property Site No. 30-10-9302, and is listed on the National Register of Historic Places.

In 1974, McBryde Sugar Company acquired the lease of the project's Kōloa Mill and surrounding lands from Grove Farm which was closing their sugar operations due to the decline of this industry from international competition. McBryde Sugar Company shifted its milling operations to Kōloa and also upgraded and expanded the Kōloa Mill so that it could handle all of the company's harvest. This mill continued in operation for another 22 years until Hurricane Iniki destroyed much of the company's fields in 1991. The company gradually phased out of sugar production and closed the mill and operations in 1996. The closing of this Kōloa Mill has therefore created an opportunity for the adaptive reuse of certain portions of it for the proposed regional wastewater treatment facility.

FIGURE 2-2
PROJECT VICINITY MAP
KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utrifles, LLC



LEGEND

- Regional Facility Project
- Koloa Collection System
- Po'ipu Collection System
- Eastern Collection System

Source:
Digital Globe (Aerial Map - May 2007)
Aqua Engineers, Inc. (Regional Facility System)



An architectural inventory survey of the Kōloa Mill conducted by Masons Architects, Inc. identified eight (8) buildings and five (5) structures that remain standing. A copy of this report is included in Appendix E of this document. These buildings consist of the following: 1) bagasse storage building; 2) sugar mill; 3) parts warehouse; 4) water pump sheds; 5) office building; 6) electric shop and laboratory; 7) sugar bins; and 8) sugar storage building. The structures identified consist of the following: 1) water tank; 2) molasses tank; 3) day tank; 4) foundations of former cleaning plant; and 5) stack.

Of these buildings and structures, only the bagasse storage building and water tank would be used by the proposed regional wastewater treatment facility. This bagasse storage building and water tank are not 50 years old, and did not appear to meet the National Register's Criteria Consideration G for exceptional importance for properties less than 50 years old. These are not considered to be historic properties, and are discussed further later in this document.

Surrounding uses in the immediate vicinity of this Kōloa Mill site consist of mostly vacant agricultural land formerly used for plantation sugar activities. An all-terrain vehicle (ATV) commercial operation has a base yard located at the end of Weliweli Road. The agricultural lands located north (mauka) further inland of the Kōloa Mill site appear to be used for these commercial recreational activities. There are also some small scale agricultural activities occurring further east of the mill site.

Former Plantation Agricultural Area

Two wastewater collection system routes identified as the Po'ipū Collection System and Eastern Collection System are routed from the Kōloa Mill site makai (southbound) to the Po'ipū community located along the coastline as shown on Figure 2-2. These collection systems would traverse agricultural land formerly used for sugar plantation operations. The collection system route would generally follow existing cane haul roads which are unpaved dirt or gravel roads (see Exhibit 2-2). Areas along these cane haul roads consist of fallow agricultural land although



Exhibit 2-2 – South View of Cane Road Used for Eastern Collection System Route

some areas further away may be used for agricultural use. An agricultural residential subdivision has also been created between Ala Kinoiki Road and the cane haul road.

The route for the Po'ipū Collection System would proceed in a southwest direction toward the Kiahuna area generally following along an old railroad alignment that is also used as a waterline route. This area is somewhat similar in character to the route along the Eastern

Collection System route which is undeveloped fallow land formerly used for plantation agricultural. However, the vegetation in this area tends to be more overgrown. Appendix B includes some photos of these areas.

Kōloa Town

One section of the proposed wastewater collection system will be routed through an area of Kōloa Town before being routed to the regional treatment facility. Kōloa Town can be characterized as older town whose development was associated with former plantation activities in this region. This town serves as the urban center of the Kōloa community with several businesses established in the area (see Exhibit 2-3). This town also has a mix of both single-family and multi-family residences and community facilities such as the Kōloa School, a history center, and community civic center.



Exhibit 2-3 – West View of Kōloa Town along Kōloa Road

The Kōloa Collection System is planned to have a wastewater service area that would accommodate several existing developed properties and planned developments within the area as shown on the previous figure. New gravity sewer lines and force mains would be routed within or along Kōloa Road, Waikomo Road, and Weliweli Road to service the planned areas. Some of the notable land uses present in the area along this route include Big Save, various retail and specialty shops, light industrial businesses, and undeveloped parcels planned for future commercial and residential development. Appendix B has some photos showing existing and surrounding uses along these roadways.

A new wastewater pump station would be provided within an undeveloped area near the intersection of Waikomo Road with Weliweli Road. The proposed force main route from the pump station along Weliweli Road, eastbound to the Regional WRF, are generally undeveloped as shown on Exhibit 2-4. The collection system route does cross the intersection with Ala Kinoiki Road.



Exhibit 2-4 – Eastbound View along Weliweli Road

Po'ipū community

The Po'ipū and Eastern Collection Systems are routed from the Regional WRF makai (southbound) to the Po'ipū community located along the coastline as previously shown on Figure 2-2. This service area encompasses existing developed properties along the coastline along with other planned developments within the Po'ipū area extending from the Grand Hyatt Kaua'i Resort and Spa westbound toward the planned development of Kukui'ula.

Po'ipū is predominantly characterized with visitor oriented land uses and vacation properties mostly situated makai of Po'ipū Road. Such visitor oriented uses include resorts, hotels, timeshare condominiums, and bed and breakfast operations such as the Grand Hyatt Kaua'i Resort and Spa, Sheraton Kaua'i Resort, and Po'ipū Bay Golf Course. Other uses include single-family residences and commercial businesses. Situated between Kōloa Town and Po'ipū is the growing Kiahuna development which includes the Kiahuna Golf Course and several residences.

2.1.2. Project Site and Ownership Information

The new Regional WRF including the wastewater collection system components is planned to encompass a total area of about 10.5 acres. The wastewater collection system includes four (4) WWPSs along with gravity lines and force mains situated within existing undeveloped lands, roadways or along established utility line corridors or unpaved roadway corridors. This total is summarized below and discussed in greater detail.

<u>Summary of Project Site Acreage</u>		
1.	Regional WRF	1.98 acres
2.	Infiltration basin and connection line	2.12 acres
3.	Wastewater pump stations (4 total)	0.25 acre/each 1.00 acre
4.	Wastewater collection system lines	8-foot-wide easement <u>5.43 acres</u>
	TOTAL ACREAGE	10.53 acres

Regional Wastewater Reclamation Facility

The new Regional WRF will be situated within an agricultural area utilizing a portion of the existing Kōloa Mill site. This site is located east of Weliweli Road and about one mile further east of the Kōloa Town area as shown on Figure 2.2. The water reclamation facility will be developed on a site of about 2 1(1.98 acres). The infiltration basin used as part of the treatment system is located slightly further east of the facility, and will be developed on an approximately 2.0 acre area. The length of the line connecting the facility to this basin would be about 650 feet and thus involve about 0.12 additional acres based upon an 8-foot-wide easement. Therefore, the total area associated with the water reclamation facility would be about 4.12 acres.

The Regional WRF will be situated across two separate properties identified as Tax Map Key No. (4) 2-09-001: portion of 001, and (4) 2-09-002: portion of 001. The property line

separating these two parcels generally runs through the center of the facility site. The property under TMK 2-09-001 is about 1,076 acres and owned by Visionary, LLC which is an affiliate of Grove Farm Company, Inc. The property under TMK 2-09-002 is about 2,371 acres and owned by Grove Farm Company, Inc. Figure 2-3 shows the location of the proposed Regional WRF site in relation to these tax map key parcels.

Wastewater Pump Stations

The wastewater collection system component of the project consists of four (4) WWPSs along with gravity lines and force mains situated within existing undeveloped lands, roadways or along established utility line corridors or unpaved roadway corridors. Each wastewater pump station is estimated to utilize an area of 0.25 acres (10,890 sf) or less for a combined total of one (1) acre.

The four wastewater pump stations would consist of: 1) Kōloa WWPS, 2) Villages WWPS, 3) Crater WWPS, and 4) the Eastern WWPS. The “Kōloa WWPS” is proposed to be located on an undeveloped parcel of about 9.4 acres situated along Weliweli Road near its intersection with Waikomo Road. This property is identified as TMK 2-08-011: portion of 001 and is privately-owned by the Eric A. Knudsen Trust.

The “Villages WWPS” will be located within an undeveloped site just mauka of the existing Kiahuna Swim and Tennis Club facility and east of Hapa Road within a large parcel of about 122.9 acres. This property is identified as TMK 2-08-014: portion of 019 and is privately-owned by the Eric A. Knudsen Trust.

The “Crater WWPS” will be located within an undeveloped site east of the existing water tanks near Puuhi Reservoir within a large parcel identified as TMK: (4) 2-09-001: portion of 001. This property is where the Regional WRF would also be located on, and is about 1,076 acres and owned by Visionary, LLC which is an affiliate of Grove Farm Company, Inc.

The “Eastern WWPS” will be constructed within a parcel presently used as an existing individual packaged wastewater treatment plant serving the Grand Hyatt Kaua'i Resort and Spa. This site is located mauka (inland) of Po'ipū Road next to some holes of the Po'ipū Bay Golf Course. The parcel is identified as TMK: 2-09-001: portion of 008 and is about 2.8 acres. This property is owned by Grove Farm Company, Inc.

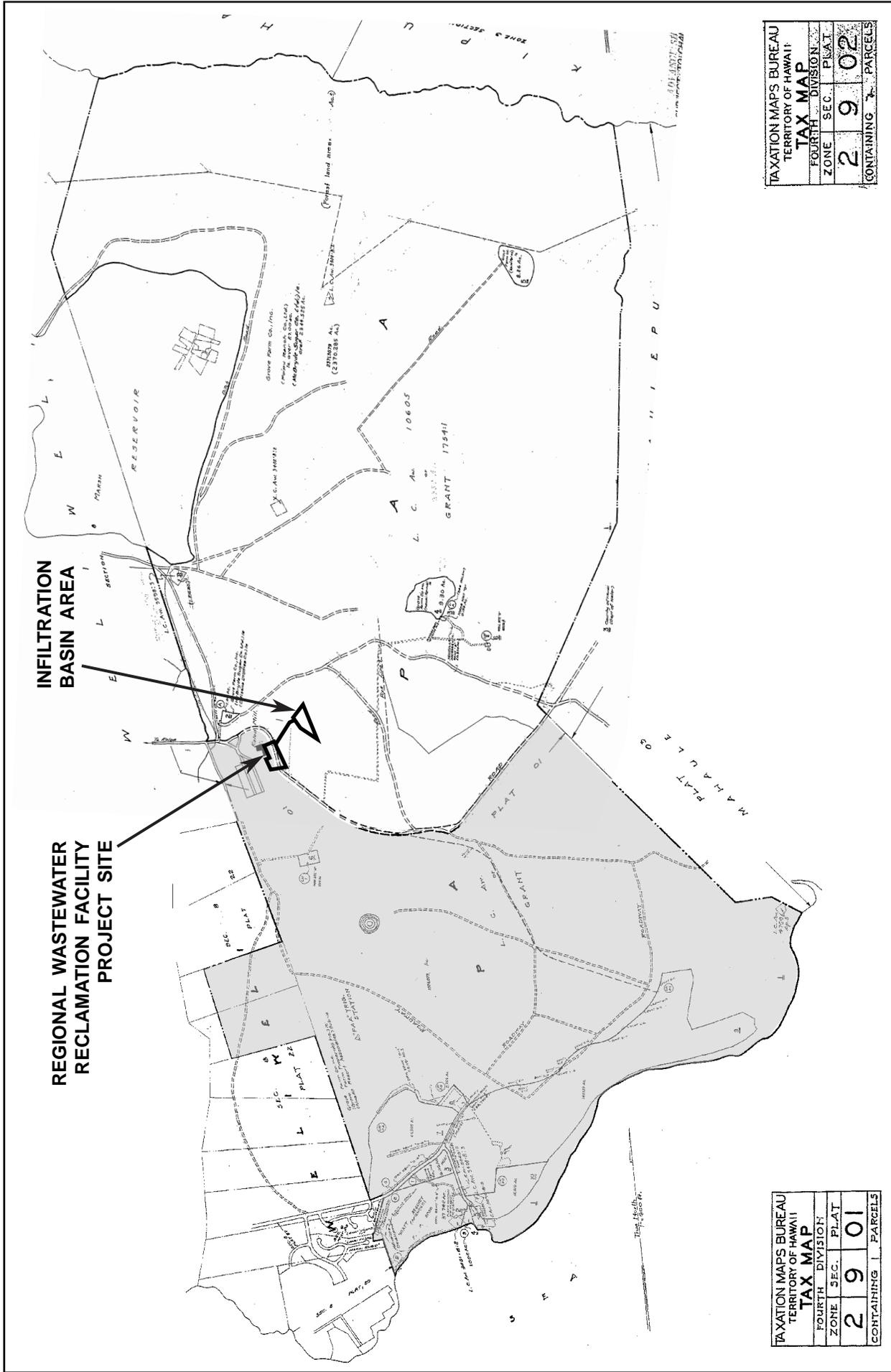


FIGURE 2-3
REGIONAL WRF TAX KEY MAP
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

Source:
 County of Kauai

Sewer Collection System

The wastewater collection system would be situated within various parcels and roadways within the project area. New sewer lines associated with the Kōloa Collection System would be routed within both privately-owned property and the rights-of-way for portions of County roadways which are Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road. Privately-owned properties affected include parcels associated with Tax Map Keys (TMKs): 2-08-004: portion of 003, 2-08-008: portion of 001 and 036 (Yamada Road), 2-08-009: portion of 001, and 2-08-011: portion of 001, 2-08-014: portion of 023, and 2-08-022: portion of 001.

Sewer lines associated with the Po'ipū and Eastern Collection Systems would predominantly be located within privately owned property and a few County roadways. These properties are identified as TMKs: 2-08-014: portions of 005 (Kiahuna Plantation Drive), 019, 030, and 037; (4) 2-08-022: portions of 011, 021, and 030; (4) 2-09-001: portion of 001.

Appropriate easements for these collection system improvements will be acquired from private land owners or the County of Kaua'i. An 8-foot-wide easement is planned for the collection system lines. Based upon this easement width, the total acreage used for this collection system would be about 5.4 acres. Figure 2-4 shows the TMK parcels affected by the sewer collection system improvements.

2.2. PROJECT NEED AND OBJECTIVES

This section discusses the need for the regional wastewater facility and collection system project along with the project objectives. Background information on existing wastewater facilities serving this region is also provided.

2.2.1. Background on Existing Wastewater Facilities

The existing wastewater system in the Kōloa-Po'ipū area consists of the existing Po'ipū WRF along Po'ipū Road and several packaged wastewater treatment plants (WWTPs) which serve existing developments in Po'ipū located east of Weliweli Tract. There are also large capacity cesspools (LCCs) serving the various businesses within Kōloa Town, and individual cesspools and septic tank systems serving individual residences within the Kōloa-Po'ipū area.

Po'ipū Wastewater Reclamation Facility

The existing Po'ipū WRF was constructed in 1981 as a sub-regional wastewater system by the Moana Corporation and other area resorts. The Po'ipū WRF is now owned by HOH Utilities, LLC and is operated by Aqua Engineers, Inc. It is located on approximately 2.0 acres of land adjacent to and mauka of Po'ipū Road, approximately 0.2 mile west of the intersection of Kiahuna Plantation Drive. The facility currently treats wastewater flows from various resort developments in Po'ipū, as well as the Po'ipū Shopping Village.

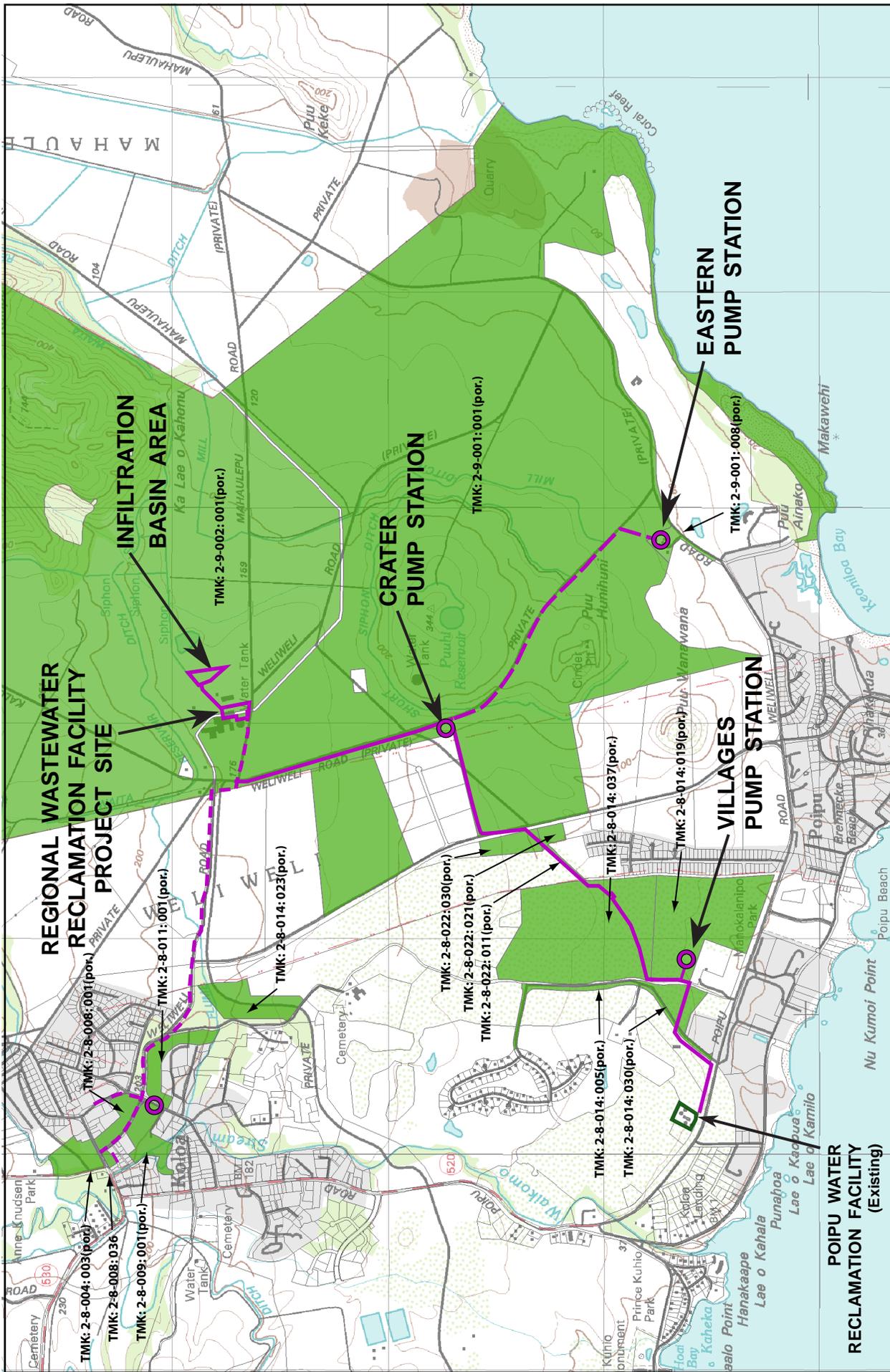


FIGURE 2-4
WASTEWATER COLLECTION SYSTEM TAX MAP KEY
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

The Po'ipū WRF was upgraded in 2005 from an initial design capacity of 0.5 million gallons per day (mgd) to a new design capacity of 1.0 mgd, with a peak hour flow capacity of 3.5 mgd, and from an R-2 (secondary) treatment system to a R-1 (tertiary) treatment system with filtration and ultraviolet (UV) disinfection systems. The Po'ipū WRF currently treats approximately 360,000 gallons per day (gpd) of wastewater, with the effluent used to irrigate the existing Kiahuna Golf Course.

As part of this plant's upgrade, an integrated influent pump station was recently constructed within the Po'ipū WRF site to distribute the flow between the existing Po'ipū WRF and the new proposed Regional WRF. There are no other improvements planned to be constructed as part of this facility.

Packaged Wastewater Treatment Plants and Cesspools

Currently, many of the existing resort developments in Po'ipū operate their own wastewater treatment facilities. There are currently a total of 16 privately-owned packaged WWTPs serving these developments, including the Grand Hyatt Kaua'i Resort and Spa. A packaged WWTP consists of units or modules designed for construction, assembly, connection, and installation at the site for treatment of wastewater. These facilities require less space for operations. Such systems typically treat wastewater with an aerobic process based upon the biological extended aeration principle involving microorganisms to consume organic domestic wastewater.

To date, existing businesses within Kōloa Town have relied on large capacity cesspools (LCCs) for wastewater disposal. LCCs are defined as those serving multiple (two (2) or more) dwellings, or those for non-single-family residential buildings/businesses having the capacity to serve 20 or more persons per day. On December 7, 1999, the U.S. Environmental Protection Agency (EPA) promulgated regulations under the Safe Drinking Water Act, Underground Injection Control (UIC) Program which prohibited the construction of new large capacity cesspools (LCCs) effective April 2000. This law required the closure or upgrade of all existing LCCs by April 5, 2005 to prevent contamination of current and potential underground sources of drinking water.

Existing single-family residences in the Po'ipū and Kōloa Town areas currently utilize individual cesspools and septic tank systems to dispose of their wastewater because there is no County provided sewer collection system serving this region. Since the proposed Regional WRF will be a private wastewater system, there will be no requirement for the existing single-family residences to connect to the Regional WRF. However, residences will be able to connect to the regional system if owners desire to do so.

2.2.2. Need for Project Improvements

The need for the proposed Project is to provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in the south shore area extending from Kōloa Town to Po'ipū. This regional system will also allow for the planned Kukui'ula development to connect to the proposed collection system for treatment at the Regional WRF. The proposed Regional WRF is intended to treat wastewater at a tertiary level that will result in R-1 quality effluent water that can be reused for beneficial applications. The R-1 water, as prescribed under the State Department of Health, is the highest level of treated wastewater. Accordingly, these wastewater infrastructure improvements would address the multiple problems plaguing wastewater collection and treatment in the south shore area, including: replacing large capacity cesspools, replacing aging on-site package plants, providing an alternative for businesses and homeowners currently relying on cesspools or septic systems, providing a wastewater alternative for proposed new developers, and generating high-quality effluent that would be available for beneficial reuse. Greater discussion of the need for this Project is provided below.

Replace Existing Large Capacity Cesspools

To date, existing businesses and residential developments in Kōloa Town have relied on large capacity “gang” cesspools (LCCs) for wastewater disposal because there is no County or private regional wastewater collection and disposal system serving this area. Individual residences presently utilize cesspools or septic tanks systems for their wastewater treatment.

The 1998 U.S. Environmental Protection Agency (EPA) regulations (40 CFR 144.14) presently required the elimination of all large capacity “gang” cesspools used for wastewater disposal by April 5, 2005. LCCs were banned because untreated sewage is disposed into these cesspools and subsequently allowed to drain and percolate directly into the soil and groundwater, potentially causing impacts to public health along with environmental concerns. This increases the likelihood of releasing disease causing pathogens and other contaminants, such as nitrate, into groundwater aquifers, streams, and eventually the ocean.

Large capacity cesspools are defined as a cesspool serving multiple (two (2) or more) dwellings, a community or regional development, or any non-single-family residential building or business that generate sanitary wastes, containing human excreta from 20 or more persons per day. Sanitary waste, also referred to as domestic waste, consists of liquids or solid wastes originating from human activities, such as wastes collected from toilets, showers, washbasins, sinks used for cleaning domestic areas, food preparation, clothes or dishwashing operations (DOH, August 2004). Examples of this include a cesspool serving a duplex, an apartment building or townhouse development, a residential condominium, or multiple single-family dwellings clustered together.

In addition, a cesspool serving a non-residential building is considered an LCC if it receives sanitary waste containing human excreta from 20 or more persons in a single day. Examples of this include schools, churches, visitor centers, golf course clubhouses, park restroom facilities, retail businesses, restaurants or food establishments, hotels, and commercial or industrial uses. There are several businesses and other uses in Kōloa Town that need to comply with this regulation.

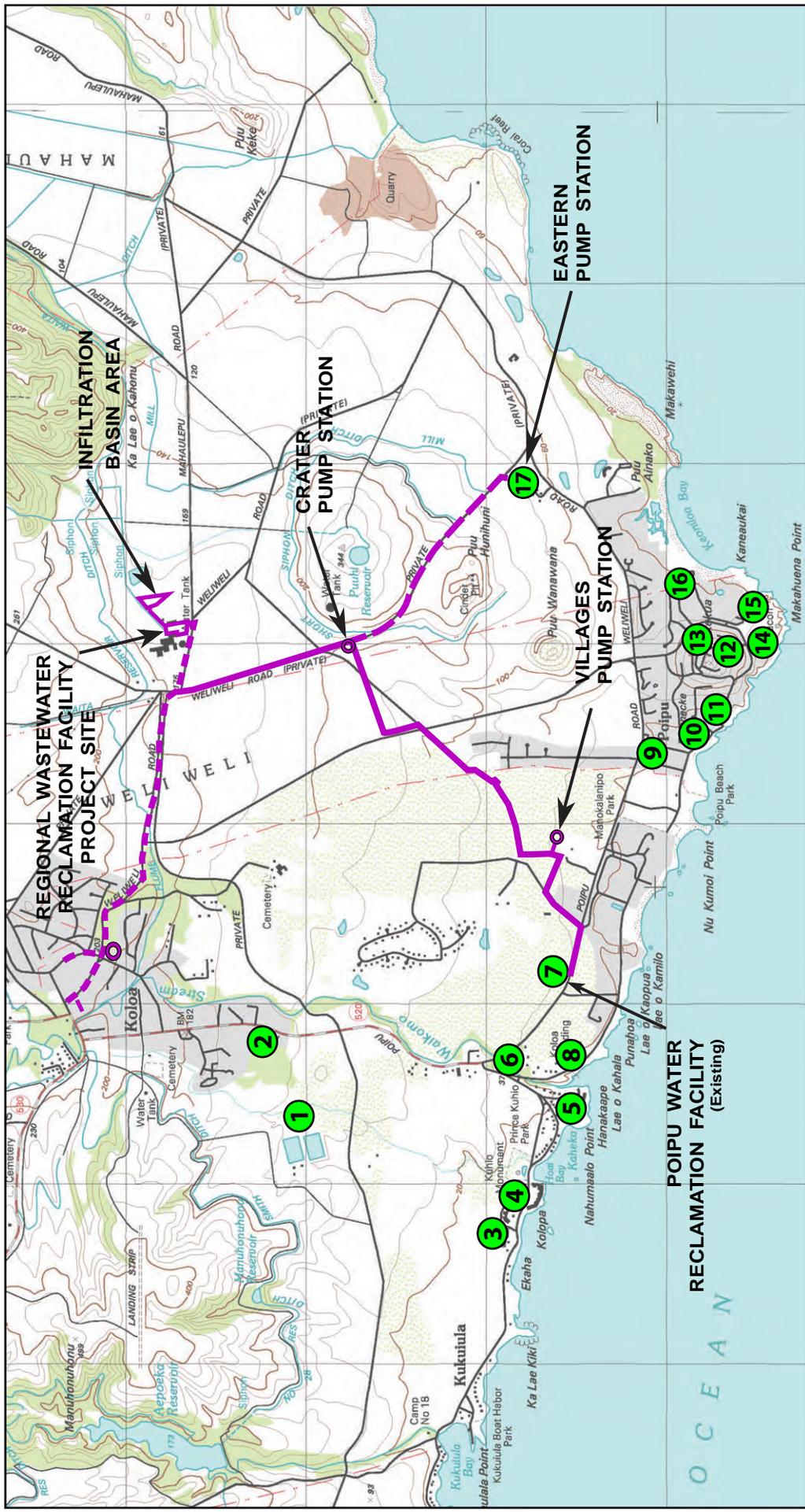
As a result of this EPA regulation, existing businesses and residential developments in Kōloa Town were required to either close or upgrade all existing LCCs by April 5, 2005. In addition, new businesses and development projects are prohibited from constructing new LCCs. Many of the exiting businesses have been unable to meet this requirement because they have inadequate land area on their existing lots to upgrade their LCCs. In addition, it is very costly for landowners to undertake designing, permitting, and constructing the necessary wastewater system upgrades. However, since there is no existing centralized wastewater system serving Kōloa Town, many landowners lack a viable option to comply with the EPA regulations.

Consequently, a centralized wastewater system is immediately needed for Kōloa Town in order for exiting business owners to comply with the EPA regulation and to mitigate effects on the environment from the existing LCCs. The proposed Regional WRF and collection system will provide these existing businesses with the opportunity to connect to the regional system, thereby providing a viable alternative for compliance with the EPA regulation. The Regional WRF will also serve new developments planned within Kōloa Town, thereby eliminating the need for these developments to construct their own on-site packaged wastewater plants. In addition, existing residences within the proposed service area that are using cesspools or septic tank systems will have the opportunity to connect to this regional wastewater system.

Replace Existing Packaged Treatment Systems

Existing developments along the southern coastline of Po'ipū, including Kukui'ula, presently operate their own wastewater treatment facilities or packaged wastewater treatment plants (WWTPs). As previously discussed, there are about 16 individual packaged WWTPs serving developments in this area with existing average daily design flows ranging from about 5,000 gallons per day (gpd) to about 180,000 gpd. Each of these treatment facilities generally has about one (1) to two (2) injection wells for the disposal of effluent. Figure 2-5 graphically shows the general location of these individual treatment systems in this area.

These packaged plants do not include a tertiary process for treating wastewater to obtain the highest quality effluent water (R-1), as it is typically neither required nor economical for small plants to provide this level of treatment. These packaged plants currently produce R-2 effluent quality water which is disposed of via injection wells predominantly located along the shoreline. A regional WRF provides the opportunity to treat the water to a higher (tertiary level).



Existing Individual Wastewater Treatment Plants

- 1 Kukuilua WasteWater Treatment Plant (WWTP)
- 2 Koba Gardens
- 3 Lawai Beach Resort WWTP
- 4 Kuhio Shores WWTP
- 5 Whalers Cove WWTP
- 6 Waikomo Streams Villas WWTP
- 7 Poipu Wastewater Reclamation Facility
- 8 Alihi Lani WWTP
- 9 Hale Kahanalu WWTP
- 10 Mhi Kai WWTP
- 11 Poipu Kai WWTP
- 12 Grand Hyatt WWTP
- 13 Poipu Shores WWTP
- 14 Sunset Kahili WWTP
- 15 Poipu Palms WWTP
- 16 Poipu Makai WWTP
- 17 Makahuena Point WWTP



Source:
HOH Utilities, LLC



FIGURE 2-5
EXISTING PO'IPU WASTEWATER TREATMENT PLANTS
KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC

Accordingly, the effluent quality would be improved and there would be increased opportunities to use the effluent in beneficial reuse applications. In addition, the existing injection wells serving these packaged plants could be closed. Therefore, the Regional WRF would also allow these existing developments that currently operate their own wastewater treatment facilities or packaged WWTPs to connect to the regional wastewater system. This will allow the individual packaged WWTPs to be discontinued and ultimately decommissioned.

Address Projected Wastewater Flows

There is a need to properly plan and implement regional improvements to accommodate the projected increase in wastewater flows from existing and planned developments in the Kōloa-Po'ipū region. New residential and commercial projects along with the expanded development of existing resorts are currently being undertaken in the Kukui'ula to Po'ipū area. These developments will exceed the 1.0 mgd treatment capacity of the existing Po'ipū WRF. Therefore, a regional approach to address wastewater collection and treatment for this region is needed. Otherwise, these planned developments will likely construct individual packaged wastewater treatment plants increasing the total number of such plants operating in the Po'ipū region and continuing the disconnected approach to wastewater management in Po'ipū.

Furthermore, there is a need for an entity to initiate the planning and programming for the implementation of a regional wastewater system to service this area. Most of the existing wastewater systems are privately owned and operated and serve individual developments. Thus, it is difficult and probably impractical for one of these landowners to initiate such regional programming efforts. The Applicant (HOH Utilities, LLC) is most-suited to undertake such a task because they are a PUC-regulated utility company and currently operated the Po'ipū WRF. Thus, the Project will help address the lack of wastewater infrastructure planning for the region.

The existing and projected wastewater flows from developments within the Po'ipū and Kōloa areas, as well as the tributary pump stations (Influent WWPS, Kōloa, Villages, Crater, and Eastern WWPS) for each development are presented in Table 2-1.

Table 2-1 Existing and Future Flows – Po'ipū and Kōloa Service Areas Kōloa-Po'ipū Regional Wastewater Reclamation Facility						
Phase	Project	Average Daily Flow (gpd)	Influent WWPS	Eastern WWPS	Crater WWPS	Regional WRF
Po'ipū Service Area						
Existing	Po'ipū WRF	386,000	✓			◆
Existing	Brennecke/Misc.	5,000	✓			◆
Existing	Lāwa'i Beach/Kuhio Shores	61,500	✓			◆
Existing	Whalers Cove	8,000	✓			◆
Existing	Waikomo Stream	16,000	✓			◆

Table 2-1 (Continued) Existing and Future Flows – Po'ipū and Kōloa Service Areas Kōloa-Po'ipū Regional Wastewater Reclamation Facility						
Phase	Project	Average Daily Flow (gpd)	Influent WWPS	Eastern WWPS	Crater WWPS	Regional WRF
Existing	Alihilani	3,800	✓			◆
Existing	Grand Hyatt	144,200			✓	◆
Existing	Makahuena	25,000			✓	◆
Existing	Po'ipū Kai	103,000			✓	◆
Existing	Hale Kahanalu	1,450			✓	◆
Existing	Nihikai	10,000			✓	◆
Existing	Po'ipū Shores	7,500			✓	◆
Existing	Sunset Kahili	6,000			✓	◆
Existing	Po'ipū Palms	2,150			✓	◆
Existing	Po'ipū Makai	3,500			✓	◆
Existing	Weliweli Tract	32,000	✓			◆
New	Po'ipū Beach Estates (KMP-1)	34,560	✓			◆
New	Royal Palms (KMP-2)	39,360	✓			◆
New	Pili Mai (KMP-3)	45,840		✓		◆
New	Windridge (KMP -4)	67,200		✓		◆
New	Wainani (KMP-5)	22,400		✓		◆
New	Kōloa Landing	80,400	✓			◆
New	Starwood Expansion	57,600	✓			◆
New	Po'ipū Beach Hotel	33,880	✓			◆
New	Village at Po'ipū -I	16,000		✓		◆
New	Village at Po'ipū-II	40,160		✓		◆
New	Village at Po'ipū-III Phase 1	29,920		✓		◆
New	Village at Po'ipū-III Phase 2	29,920		✓		◆
New	Kukui'ula	560,000	✓			◆
New	Po'ipū Shopping Village Exp.	16,800	✓			◆
Kōloa Service Area						
Existing	Old Kōloa Town	2,250				◆
Existing	Sueoka Store	2,500				◆
Existing	Big Save	2,500				◆
Existing	Bendor Village/Po'ipū Realty/Fish Market	1,840				◆
Existing	DMB Employee Housing	5,520				◆
Existing	Hale Ohana	11,250				◆
Existing	Kōloa Shops (Wine Store)	800				◆
Existing	Dr. Murray	1,600				◆

Table 2-1 (Continued) Existing and Future Flows – Po'ipū and Kōloa Service Areas Kōloa-Po'ipū Regional Wastewater Reclamation Facility						
Phase	Project	Average Daily Flow (gpd)	Influent WWPS	Eastern WWPS	Crater WWPS	Regional WRF
Existing	Kōloa Early School	560				◆
New	Village at Kōloa Town	22,720				◆
New	Kōloa Creekside	19,840				◆
New	The Shops at Kōloa Town	16,000				◆
New	Potential Future Development	41,360				◆
Total Average Daily Demand		2,018,150				

2.2.3. Project Objectives

The Project would address the need for a regional wastewater system serving the existing communities from Kōloa Town makai to Po'ipū along with the developing Kukui'ula community. The Project includes a new wastewater collection system, new pump stations, and a new regional treatment facility. This new facility would also include tertiary treatment producing R-1 effluent which is the highest standard currently regulated by the State Department of Health. A summary of the Project's objectives in addressing this need is provided.

1. The regional system will allow for the replacement of existing LLCs in Kōloa Town.
 - a. The collection system will extend to Kōloa Town to include that area as part of the service area for the Regional WRF.
 - b. Existing developments will be able to connect to this regional system, and those respective landowners will then be able to close their LLCs.
 - c. Closing of the LLCs will allow landowners to comply with the EPA regulation mandating their closures.
 - d. Residences along the service route will have the option to close their cesspool and connect to the regional system.
2. Existing packaged WWTPs in the areas of Lāwa'i , Kukui'ula, and Po'ipū will have the opportunity to connect to the regional system.
 - a. These existing systems can be phased out over time and result in the closure of their associated injection wells.
 - b. Connecting to the regional system will result improved effluent quality (R-1 vs. R-2).
3. The regional system will provide sufficient capacity to accommodate the current and future demands projected for the area.
4. The tertiary treatment process implemented under the regional system will provide positive benefits to the environment by improving the water quality of effluent discharged.

- a. The R-1 effluent from the regional treatment facility can be reused for irrigation or in other beneficial reuse applications.
 - b. Reuse of the R-1 quality water will lessen the demand placed on potable water resources.
5. HOH Utilities, LLC and Aqua Engineers, Inc., have the experience and resources to plan, program, and construct this regional wastewater system.

2.3. PROJECT DESCRIPTION

The proposed Project consists of the Regional WRF and collection system improvements. Figure 2-6 shows a preliminary site plan identifying the location of the facilities and route of the collection system improvements. The proposed wastewater facility improvements will encompass a total of approximately 10.5 acres of land.

2.3.1. Regional Wastewater Reclamation Facility

The proposed Regional WRF will be developed on the site of the existing Kōloa Mill which has not been in operation for about 10 years. The service area planned to be accommodated by this facility will extend from Kōloa Town southbound to the developed coastline area of Po'ipū. It will also include the area mauka of the Grand Hyatt Resort presently consisting of agricultural land formerly used for plantation sugar operations.

The new Regional WRF facility is planned to treat excess wastewater over the existing Po'ipū WRF's 1.0 mgd capacity. The Regional WRF will also treat the waste activated sludge from the Po'ipū WRF and wastewater generated from other residential and commercial developments within the Kōloa Town and Po'ipū service areas. This new facility will treat wastewater to meet the State DOH's R-1 quality water requirements (Title 11, Chapter 62).

The Regional WRF will be developed in phases based on the demand for wastewater treatment. The first phase of the facility is scheduled for completion in 2010, and will be designed for a 0.1 mgd (100,000 gallons) average daily flow (ADF). The second phase of the facility which is scheduled for completion by 2015 will expand the capacity to 1.0 mgd ADF. A preliminary site plan for this 1.0 mgd facility is provided on Figure 2-7. A preliminary site plan for the first phase of the facility (0.1 mgd) is provided on Figure 2-8. This first phase would not require the use of the infiltration basin, but it would be incorporated as part of the second phase.

Beyond 2020, the demand for new wastewater treatment capacity will be dependent upon the connection of future developments located in the Po'ipū and Kōloa areas. Should these existing and future developments connect to the Regional WRF, the facility would be expanded to a capacity of about 1.9 mgd ADF. There are currently no plans to expand this facility beyond this capacity. A total of 2.9 mgd would therefore be available to process wastewater within this region based upon the Regional WRF's expanded capacity of 1.9 mgd plus the existing Po'ipū WRF capacity of 1.0 mgd.

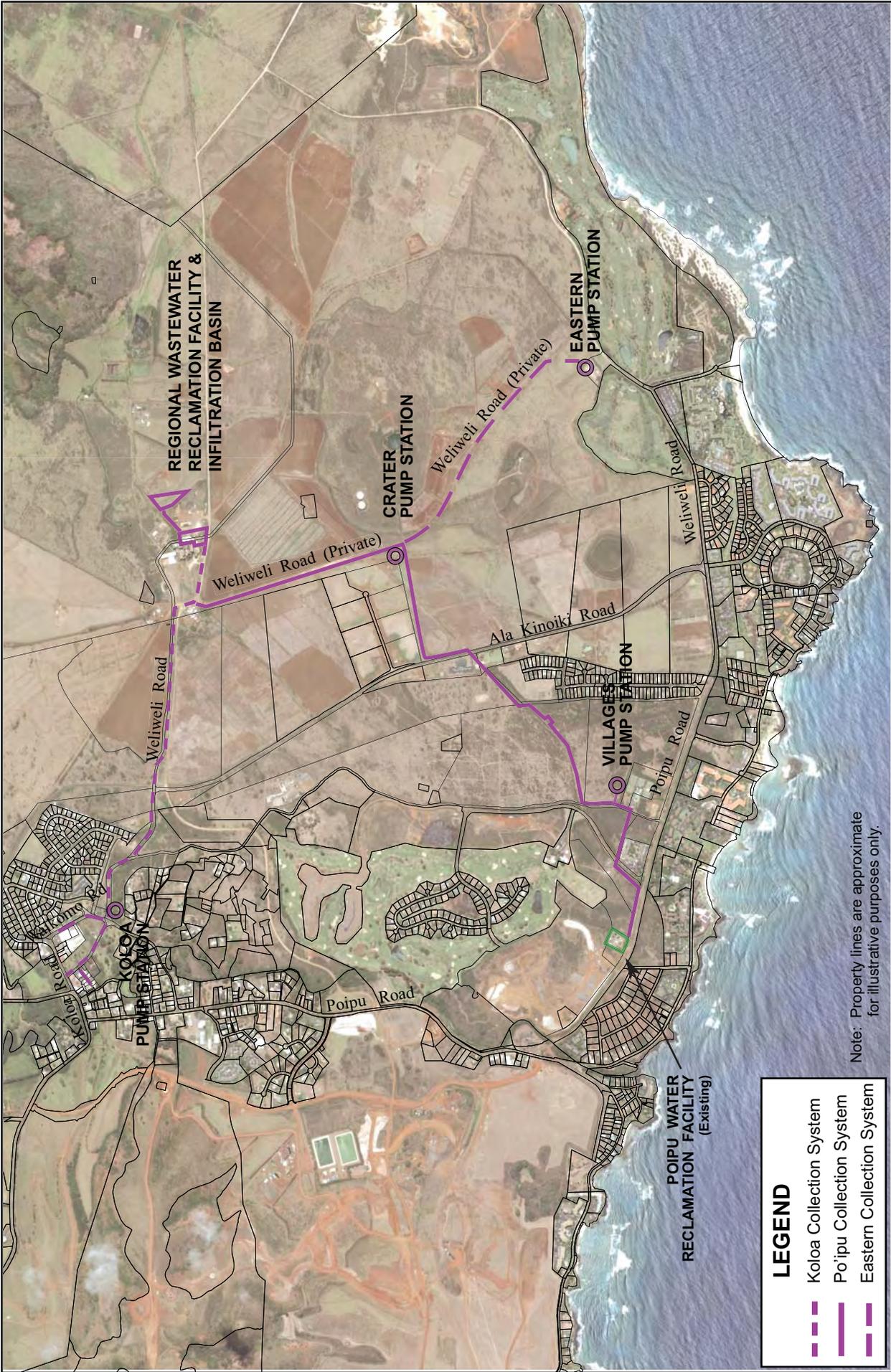


FIGURE 2.6
REGIONAL FACILITY IMPROVEMENTS SITE PLAN

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

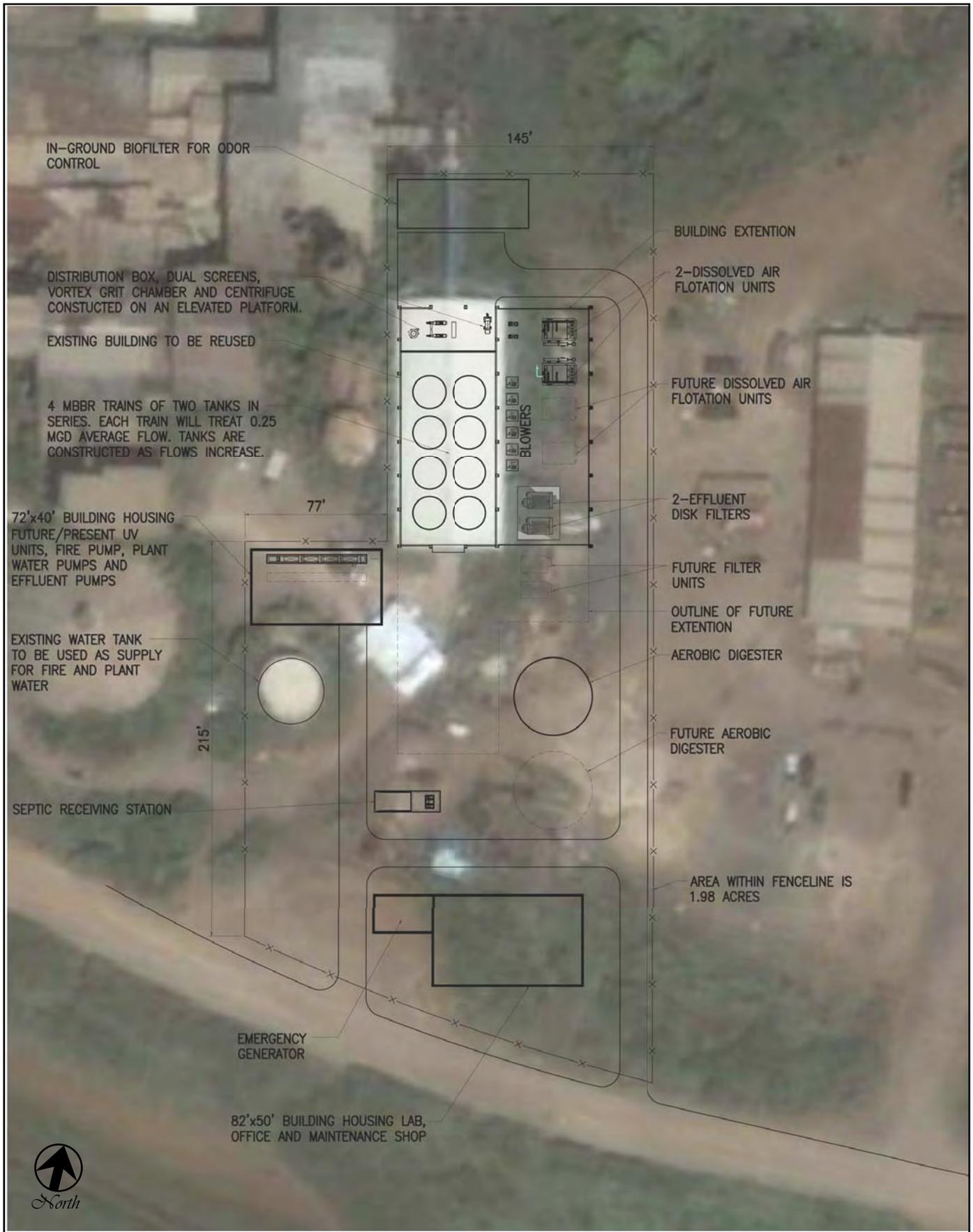
Note: Property lines are approximate for illustrative purposes only.

LEGEND

-  Koloa Collection System
-  Po'ipu Collection System
-  Eastern Collection System

Source:
 Austin Tsutsumi Associates &
 Engineering Concepts, Inc.
 Digital Globe (May 2007 Aerial)
 State Office of Planning (GIS TMK Data)





Source:
HOH Utilities, LLC

FIGURE 2-7
PRELIMINARY REGIONAL WASTEWATER
RECLAMATION FACILITY (1.0 MGD) SITE PLAN
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC





Source:
HOH Utilities, LLC

FIGURE 2-8
PRELIMINARY REGIONAL WASTEWATER
RECLAMATION FACILITY PHASE 1 SITE PLAN
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC



Reuse of Treated Wastewater and Infiltration Basin

The R-1 quality effluent water produced from the Regional WRF is proposed for reuse to irrigate lands around the Regional WRF, including the adjacent agricultural lands around the existing Po'ipū Bay Golf Course located adjacent to the Grand Hyatt Kaua'i Resort and Spa. The Po'ipū Bay Golf Course is currently irrigated with non-potable water from the existing Waita Reservoir, which is located mauka of the proposed Regional WRF site.

When the Regional WRF is completed, a line will connect the treatment facility to the existing irrigation system serving the Po'ipū Bay Golf Course. Thus, effluent water from the Regional WRF will allow the use of the non-potable water required from the Waita reservoir to be minimized.

An infiltration basin is planned as part of the treatment process for the Regional WRF. This basin would be about two acres in size and located about 600 feet to the northeast of the treatment facility. Figure 2-9 includes a graphic showing the proposed location and dimensions of this basin. The basin is planned to be designed to have 5-foot tall sidewalls around it to accommodate a maximum water level of about 3 feet in depth. The sidewalls would be constructed at a 2 to 1 slope ratio.

This basin would serve as a detention and infiltration pond for the wastewater effluent and provide the DOH-required back-up disposal system. Excess R-1 water along with effluent that does not conform to R-1 water quality standards would be discharged into this infiltration basin for disposal.

Based upon consultation with the State Department of Health, the Applicant needs to provide a basin large enough for one (1) day production capacity from the Regional WRF. Accordingly, the proposed two acre infiltration basin will be able accommodate up to approximately 2.0 million gallons of effluent. Preliminary coordination between the State Department of Health, Wastewater Branch and Aqua Engineers, Inc. regarding this alternative disposal method have been conducted and determined that it will be acceptable.

Adaptive Reuse of Buildings

The Regional WRF is planned to involve the adaptive reuse of the existing bagasse storage building and water tank as shown on the site plan in Figure 2-7. Adaptive reuse is the process of adapting old structures for purposes other than those initially intended. Adaptive reuse of portions of the mill was a smart growth concept incorporated into the project's design because it contributes to land conservation. Utilizing certain buildings from the mill was viewed as an opportunity to redevelop and reuse portions of the mill site in an efficient and environmentally responsible manner.

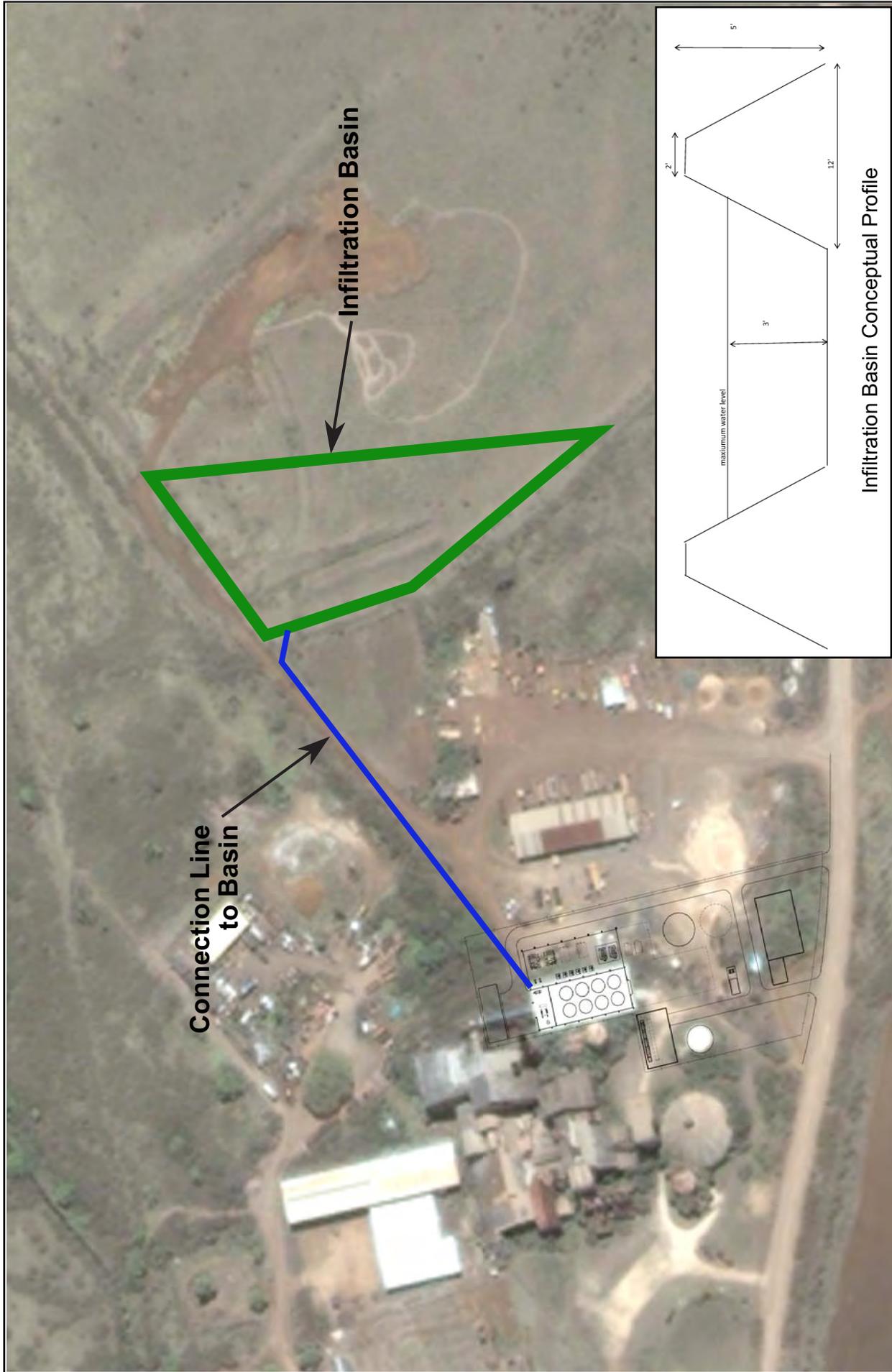


FIGURE 2.9
INFILTRATION BASIN SITE PLAN

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC

Source:
HOH Utilities, LLC

The bagasse storage building (see Exhibit 2-5) was determined to not be a historic property based upon an architectural inventory survey of the Kōloa Mill conducted by Masons Architects, Inc., and is estimated to have been constructed in 1975 (MAI, June 2009). The water tank was also determined to not be a historic property and was also estimated to be constructed in 1975. Thus, there are no historical factors restricting the reuse of the bagasse building and water tank for this project.

An extension of the eastern section of this building would be required when the capacity of the plant is expanded from 0.1 mgd (first phase) to 1.0 mgd (second phase). Other modifications to this bagasse storage building would be associated with interior renovations to serve the treatment facility's equipment. An existing conveyor for sugar cane that is connected to this building from the mill



Exhibit 2-5 –View Bagasse Storage Building
Source: Mason Architects, Inc.

would also need to be removed. The historic character and nature of the Kōloa Mill will be incorporated into design plans prepared for this building during the project's design phase. No major changes to the existing water tank are anticipated at this time. The design of other buildings and components associated with the Regional WRF will be compatible with the architectural characteristics of the Mill to the extent possible.

Integration with Existing Po'ipū WRF

The existing Po'ipū WRF is not included as part of the proposed Regional WRF project improvements. However, this existing treatment facility will be connected to this regional system and serve as part of the overall wastewater system. Thus, some discussion of this treatment plant's integration with the regional facility is provided.

The Po'ipū WRF will continue treating wastewater from the surrounding Po'ipū area up to its capacity of approximately 1.0 mgd. Beyond this capacity, the excess flows would be conveyed to the Regional WRF for treatment and disposal. The Po'ipū WRF will also continue to supply reclaimed water to the Kiahuna Golf Club and users in the area. Currently, it is anticipated that the capacity of the Po'ipū WRF will be exceeded by 2015, which will trigger the construction of the second phase of the Regional WRF. Accordingly, at this time, these excess flows from the Po'ipū WRF will be conveyed to the Regional WRF.

An integrated influent WWPS was constructed on the existing Po'ipū WRF site as part of a recent upgrade which will distribute flows to either the Po'ipū WRF or to the proposed Regional

WRF. Flows that are directed to the Regional WRF will be conveyed via the two (2) planned WWPSs included with the project which are the Village Pump Station and Crater Pump Station.

2.3.2. Treatment and Disposal System Improvements

The Regional WRF will be designed to meet the R-1 quality standards pursuant to HAR State DOH, Chapter 62, Title 11 Wastewater Systems. Accordingly, tertiary treatment (filtration) and disinfection is included in the design. Also, since DOH regulations require a back-up disposal system, in the event that the effluent does not meet R-1 standards, an infiltration basin, located adjacent to the WRF, will be used for disposal of non-compliant effluent. Figure 2-7 included a preliminary site plan for this new Regional WRF with 1.0 mgd capacity. The proposed treatment and disposal process for the Regional WRF is described in greater detail below.

Pretreatment Process

The raw wastewater will be pumped from the proposed Crater WWPS and Kōloa WWPS through separate flow meters before entering the headworks of the Regional WRF. The entire headworks will be elevated and constructed on steel supports with an operations platform to take advantage of the head produced by the two aforementioned pump stations. The headworks will provide preliminary treatment of the raw wastewater, which includes screening and grit removal.

The raw wastewater will enter the headworks where a splitter box will direct the flow to one of two rotary drum screening units. Each screening units will be outfitted with a 0.25-inch perforated rotary drum screen. Any debris within the wastewater stream larger than 0.25-inch will be removed, cleaned, dewatered and compacted by the rotary drum screen assembly. Each screen will have a chute to discharge the screenings to a dumpster located below at grade level. Adequate access to the dumpster will be provided to allow the operations personnel to remove the dumpster for disposal at the County's Kehaka Landfill.

After screening, the wastewater will flow to a vortex grit chamber, where fine, inorganic, inert, sand-like materials will be removed from the wastewater. The grit slurry will flow by gravity to a grit classifier to remove organics from the inert grit and to dewater the grit. The washed grit will be deposited in the same dumpster as the screenings.

The screening unit and grit removal unit will be enclosed to contain the foul odors and gases emitted. A blower will continuously evacuate air from the headspaces in the units. The blower will discharge the foul air into an odor control biofilter. The biofilter will be an in-ground system using soil or other material as the media. From the vortex grit system, the wastewater will flow by gravity to a common manifold which will distribute the wastewater to the secondary process units.

The use of primary clarifiers will not be incorporated in the facility. This will eliminate the need for handling of the raw primary sludge and associated increased odor potential. Dewatering of the aerobically digested stabilized sludge will be undertaken through mechanical means versus a less costly, but potential odor-producing drying bed type of operation.

Secondary and Tertiary Treatment Processes

The secondary treatment process selected was the Moving Bed Biofilm Reactor (MBBR). The MBBR is an attached growth process which utilizes plastic media as a biofilm carrier. The media are suspended within the aerated biological reactors which are retained within the tanks by screens. From the reactor tanks, the wastewater is conveyed to the two dissolved air flotation thickener (DAFT) units for solids/liquid separation. In this process, air will be introduced to the wastewater to “float” the solids/liquid separation. The clean water will flow out the bottom of the unit, which the solids are skimmed off the top. The DAFT units will be complete packaged units requiring a concrete foundation and electrical and piping connections. It will be housed in an enclosed extension of the bagasse storage building as shown on Figure 2-7.

Following the DAFT, cloth disk filters and a ultra-violet (UV) disinfection unit will be provided for the filtering and disinfection of the effluent to meet the R-1 reclaimed water standards. The UV unit will eliminate the need for any type of chlorine to be used and the associated hazards of working with chlorine. The cloth disk filters will be complete packaged units requiring a concrete foundation and electrical and piping connections, and will be housed in the same extension area of the bagasse building as the DAFT units. The UV unit will be installed in a concrete channel, and sized to accommodate future flows with the addition of future banks.

Biosolids Stabilization and Dewatering

The waste activated sludge (WAS) solids from the DAFT will be pumped to an aerobic digester. The biosolids in the digester will have a solids retention time of 20 days to meet the Federal requirement to produce Class B sludge for land disposal. From the aerobic digester, the stabilized biosolids will be pumped to a mechanical solids dewatering unit to remove as much water from the biosolids as possible before being hauled off site. The mechanical solids dewatering unit will be located in its own solids handling room sized to accommodate future build-out. The solids handling room will be equipped with a ventilation system to remove any foul odors and to direct it to the centrally located odor control unit.

1. INTRODUCTION

HOH Utilities, LLC is the Applicant proposing to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region on the south shore of the Island of Kaua'i. HOH Utilities, LLC is a State of Hawai'i (State) Public Utilities Commission (PUC) regulated utility company. This project is named the "Kōloa-Po'ipū Regional Wastewater Reclamation Facility Project" or collectively referred to as the "Regional WRF Project" in this document. The proposed Regional WRF Project is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.

1.1. Project Background

The proposed Regional WRF will be situated on an approximately 2.0-acre area within a portion of the existing former Kōloa Mill site identified as Tax Map Key (TMK) No. (4) 2-09-001: portion of 001, and (4) 2-09-002: portion of 001. This site consists of property located at the eastern end of Weliweli Road in Kōloa and owned by Grove Farm Company, Inc. The wastewater collection system serving this Regional WRF's is planned to consist of the following three (3) components which are discussed in Chapter 2 in greater detail.

1. Kōloa Collection System. A wastewater collection system will be constructed having a service area that includes several existing developed properties and planned developments within the Kōloa Town area. This collection system is referred to as the "Kōloa Collection System". New gravity sewer lines, and force mains would be routed within or along Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road in an eastbound direction to the proposed Regional WRF. A new wastewater pump stations (WWPS) would also be provided near the intersection of Waikomo Road with Weliweli Road.
2. Po'ipū Collection System. A wastewater collection system will be constructed with a service area that includes several existing developed properties and planned developments within the Po'ipū area. This collection system is referred to as the "Po'ipū Collection System," and will encompass a Po'ipū service area extending from the planned Kukui'ula development in the west to the area of Weliweli tract in the east. Proposed collection system improvements includes two (2) new wastewater pump stations, gravity sewer lines, and force mains.
3. Eastern Collection System. A wastewater collection system will be constructed with a service area that generally includes the Grand Hyatt Kaua'i Resort, Po'ipu Kai, and Pe'e Road area. This collection system is referred to as the "Eastern Collection System". Collection system improvements include a new wastewater pump station, a gravity sewer line, and a force main. Effluent from the Regional WRF when built out is planned to be used for irrigation of the Po'ipū Bay Golf Course.

Buildings

The various buildings proposed to be located within the Regional WRF project site include the following:

Existing Bagasse Building: The existing Bagasse Building will be used to house the MBBR tanks, headworks and centrifuge. An extension of this building would house the DAFT units, cloth filter units and pumps.

Control Building: The Control Building will house the operations center, computer and supervisory control and data acquisition (SCADA) areas, offices, laboratory, toilet and locker facilities, break room, storage and filing rooms and maintenance areas. The instrumentation and control systems within this building will allow the facility's operators to monitor and control the operations associated with the facility's processes, as well as those of the proposed off-site WWPSs. An emergency generator building will be constructed adjacent to the control building.

Disinfection Building: The Disinfection Building will house the UV channel, fire pumps, plant water pumps and R-1 water pumps to the on-site water storage tank.

Septage Receiving Station: A septage receiving station will consist of a coarse screen and a concrete containment pad for washdown and dumping of non-hazardous, septic waste. The septage will be accumulated in a single holding tank, and will then be pumped to the aerobic digester.

2.3.3. Collection System Improvements

The wastewater collection system improvements proposed to serve the Regional WRF will consist of three systems identified as: 1) Kōloa Collection System; 2) Po'ipū Collection System; and 3) Eastern Collection System. Improvements associated with these collection systems include development of four (4) WWPSs along with gravity lines and force mains.

Kōloa Collection System

The Kōloa Collection System improvements would include approximately 8,000 linear-feet of sewer lines and a new Kōloa Town WWPS to service areas within Kōloa Town. Sewer lines would consist of new 8-inch and 12-inch gravity sewer lines, and a new 6-inch force main as part of that wastewater collection system. The Kōloa WWPS is proposed to encompass about 750 square feet of area, however, about 1,740 square feet (0.25 acre) is being utilized for planning purposes at this time. This WWPS site would be located on an undeveloped parcel situated along Weliweli Road near its intersection with Waikomo Road.

New gravity sewer lines would be routed within both privately-owned property and the rights-of-way for portions of County roadways which are Kōloa Road, Waikomo Road, and Weliweli Road. From the Kōloa WWPS, a new 6-inch force main would proceed in an

eastbound direction to the proposed Regional WRF located either along or within portions of Weliweli Road within a private easement.

The Kōloa WWPS will initially be sized to accommodate the present peak flows from Kōloa Town. The pump size is planned to be increased in the future to accommodate the additional flows from the developments along Weliweli Road. In the future, approximately 130,000 gpd is estimated to be generated from this Kōloa Town service area, and this WWPS would be designed to accommodate this total.

Po'ipū Collection System

The Po'ipū Collection System improvements include the development of two (2) new WWPSs (Villages and Crater) gravity lines and force main. This collection system will convey flows from the existing Po'ipū WRF situated along Po'ipū Road.

Existing Po'ipū WRF

An influent WWPS at the existing Po'ipū WRF will distribute flows between the Po'ipū WRF and the proposed Regional WRF. The existing Po'ipū WRF influent pump station has a capacity of 1.2 mgd, and consists of two (2) pumping facilities, both equipped with variable speed pumps. One set of pumps will be dedicated to convey flows to the existing Po'ipū WRF and the second set will convey flows to the new Regional WRF. All wastewater entering the existing influent pump station will be treated at the existing treatment plant until the Regional WRF collection system is constructed. Once the Regional WRF is completed, the pump station will distribute flows between the two facilities.

Currently, wastewater flow to the existing Po'ipū WRF is conveyed entirely by the Po'ipū WWPS No. 2 located makai of the intersection of Ho'onani Road and Kapili Road. In addition to wastewater from the Po'ipū WWPS No. 2, future flows to the influent WWPS will be conveyed from planned inland residential subdivisions (Kukui'ula) by an existing 24-inch gravity sewer line along Po'ipū Road from the west. An existing dual 18-inch gravity sewer line along Po'ipū Road to the east of the plant will convey flows from the Kiahuna Plantation Drive area.

Villages and Crater WWPSs

Two WWPSs are proposed to be located between the influent WWPS at the Po'ipū WRF and the new Regional WRF. The Villages and Crater WWPSs will operate in series to convey flows to the Regional WRF and to intercept additional flows from nearby tributary areas.

The Villages WWPS is the first intermediate pump station from the Po'ipū WRF, and is proposed to be located just mauka of the existing Kiahuna Swim and Tennis Club and east of Hapa Road at an elevation of approximately 40 feet above mean sea level (msl). Based on the projected development of the service area, the total average daily flow to the proposed Villages WWPS will be 0.6 mgd. The maximum and peak hourly flows to this pump station will be 2.3

mgd and 4.5 mgd, respectively. A preliminary site plan typical for this type of pump station is provided in Figure 2-10. Flows converging at the Villages WWPS will then be conveyed to the Crater WWPS. The design of other project pump stations would be developed during the design phase; however, this site plan provides a general representation of this type of facility.

The second intermediate WWPS, identified as the Crater WWPS, is proposed to be located east of the Kōloa Bypass Road, within existing agricultural land. This pump station would be situated along at an elevation of approximately 146 feet above msl as shown on previous figures makai of the Regional WRF. Based on the projected development of the service area, the total average daily flow entering the Crater WWPS will be 0.9 mgd. The maximum and peak hourly flows to this WWPS will be 2.9 mgd and 4.9 mgd, respectively.

In the future, existing developments east of Weliweli Tract may elect to consolidate and pump their combined wastewater flows to the Crater WWPS. This will result in a substantial increase in flow to the Crater WWPS which is reflected in the projected flows. Therefore, the infrastructure (i.e., wet well, valve boxes, piping, etc.) of the Crater WWPS will be designed to accommodate the potential ultimate flows, including those from developments east of Weliweli Tract.

Force Main Collection System

Dual 14-inch polyvinyl chloride (PVC) force mains are planned to be installed to convey flows from the existing dual 14-inch force mains along Po'ipū Road from the Po'ipū WRF to the new Villages WWPS. From the existing dual 14-inch force mains along Po'ipū Road, the alignment of the proposed dual 14-inch force mains will be routed mauka (inland) along Kiahuna Plantation Drive and then east along the northern boundary of the Po'ipū Shopping Village and under Hapa Road to the Villages WWPS, a distance of approximately 1,500 linear feet. Construction of these forces mains under and across Hapa Road is planned to be via horizontal directional drilling instead of open trench work to avoid any effects on Hapa Road.

A single 24- or 30-inch force main is planned to be utilized to convey flows from the Villages WWPS eastbound and inland to the new Crater WWPS. The dual concept is planned to use one force main to convey the entire flow, with the second line serving as a standby force main at this time. The route of the force main from the Villages WWPS site to the Crater WWPS site will generally follow the alignment of an existing County Department of Water (DOW) 18-inch water line over a distance of approximately 6,200 linear feet. This alignment would occur within privately-owned property.

A single 24- or 30-inch force main will be utilized to convey flows from the Crater WWPS to the Regional WRF. The route of the force main from the Crater WWPS site to the headworks of the Regional WRF will follow the alignment of an existing private cane haul road running through the agricultural area over a distance of approximately 4,200 linear feet.

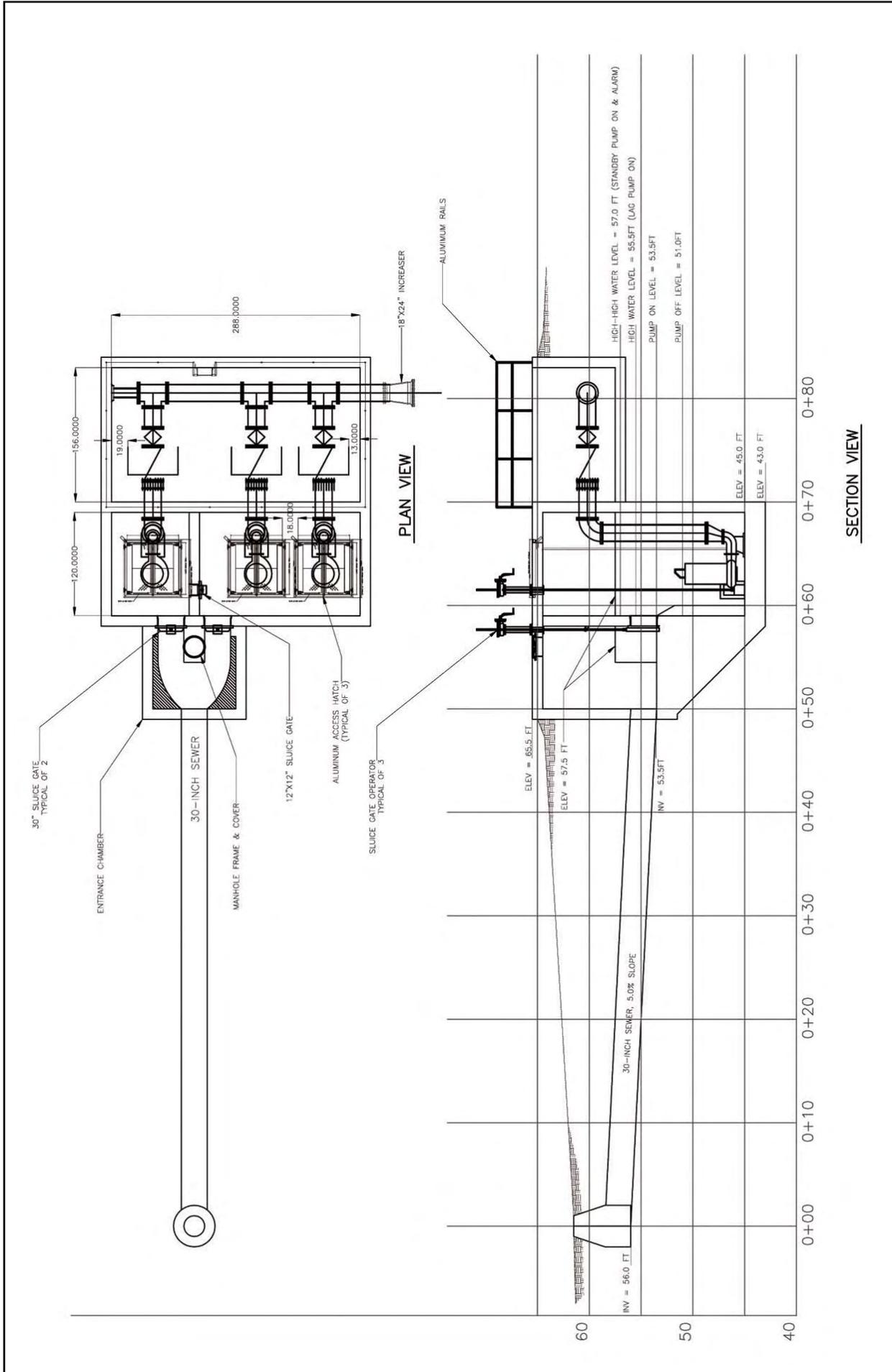


FIGURE 2-10
PRELIMINARY WASTEWATER PUMP STATION SITE PLAN
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

Source:
 Engineering Concepts, Inc. (Dec. 2007)

Eastern Collection System

In the future, another WWPS will be required to convey wastewater flows generated from existing and future developments located in the Po'ipū area situated east of the Weliweli Tract and including the Grand Hyatt Kaua'i Resort and Spa. This fourth pump station is identified as the Eastern WWPS and would convey wastewater inland (north or mauka) to the Crater WWPS for ultimate conveyance to the Regional WRF. This Eastern WWPS is proposed to be located at the site of the existing Hyatt WWTP along Po'ipū Road, and situated at an elevation of approximately 66 feet above msl.

A 24-inch force main will be utilized to convey flows from the Eastern WWPS mauka to the Crater WWPS. The route of the force main from the Eastern WWPS to the Crater WWPS will follow the alignment of an existing private cane haul road routed thru agricultural land over a distance of approximately 5,000 linear feet.

2.4. DEVELOPMENT SCHEDULE AND CONSTRUCTION COSTS

Development of the Project will be in phases based on the demand for wastewater treatment capacity. The first phase, to be completed by 2010, will provide a wastewater treatment capacity of 100,000 gpd ADF. This would include completing the Kōloa Collection System to service areas in Kōloa Town and convey wastewater flows to the regional plant.

The second phase, scheduled for completion by 2015, will expand the treatment capacity to 1,000,000 gpd ADF (1.0 mgd). Collection system improvements are likely to include the Po'ipū and Eastern Collection system components. This would connect the existing Po'ipū WRF to the Regional WRF, and provide service to all areas within Po'ipū. Existing developments along this coastline are currently served by private package WWTPs which would allow for their connection to this system and closing of those packaged plants. However, implementation of this phase would be dependent upon the construction schedules of other developments such as Kukui'ula.

Beyond 2015, the demand for new wastewater treatment capacity will be dependent upon additional demands for service created by new developments in the region. Should these developments connect to the Regional WRF's system, the facility could then be expanded to a capacity of 1,900,000 gpd ADF, with a peak hourly flow of 5,900,000 gpd. However, future expansions will be determined based upon additional demand and connections to the system.

The estimated construction cost for development of the Regional WRF up to 1.0 mgd along with the planned collection system is about \$28.0 million. Project improvements will be privately funded by HOH Utilities, LLC.

2.5. PERMITS AND APPROVALS

The following is a list of permits, approvals, and reviews that may be required prior to construction and operation of the proposed Project.

State of Hawai'i

Department of Health

- National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Associated with Construction Activity
- NPDES Permit for Dewatering
- NPDES Permit for Hydrotesting
- Noise Permit
- Air Quality Permit
- Underground Injection Control (UIC) Permit
- Wastewater Management Plan Permit
- Use of Recycled Water for Irrigation Permit

Department of Land and Natural Resources Historic Preservation Division

- Chapter 6E, HRS Historic Preservation

Office of Planning

- Coastal Zone Management (CZM) Program Consistency Review

County of Kaua'i

Planning Department

- Special Permit
- Use Permit
- Class IV Zoning Permit

Department of Public Works

- Road Permit
- Grading/Grubbing Permit
- Building Permit
- Excavation Permit
- Drainage Plan Approval

Department of Water

- Water and Water System Requirements
- Water Connection Approval

Utility Companies

- Utility Service Requirements
- Permit Regarding Work on Utility Lines

3. NATURAL ENVIRONMENT: ENVIRONMENTAL SETTING, PROBABLE IMPACTS, AND MITIGATIVE MEASURES

This chapter addresses the environmental setting generally associated with the natural environment in the project area, discusses the environmental impacts of the Project on the various resources, and identifies pertinent mitigative measures, if applicable.

Climate

The island of Kaua'i has a total land area of about 553.3 square miles, and is the fourth largest island in the Hawaiian chain. Climate on the Island of Kaua'i, as well as within the State of Hawai'i, can be characterized as having low day-to-day and month-to-month variability. Differences in the climate of various areas are generally attributable to the island's geologic formation and topography creating miniature ecosystems ranging from tropical rain forests to dryer plains along with corresponding differences in temperature, humidity, wind, and rainfall over short distances (Dept. of Geography 1998). Thus, the climate of this island is predominantly mild and equitable throughout the entire year. This climate is due to the island's location on the northern fringe of the tropics within the belt of cooling northeasterly trade winds (CWRM 1990).

The semi-arid climate of Po'ipū and Kōloa is typically dry and sunny. The climate of the Po'ipū area is very much affected by the topography of the island and its coastal situation. Winds are predominately trade winds from the east or northeast. Wind speeds average about 11 to 12 miles per hour, providing relatively good ventilation much of the time. Occasional storms may generate strong winds from the south (Kona winds) for brief periods. Land breeze-sea breeze circulations may develop when trade winds are weak (Department of Geography 1983).

Temperatures in the area are generally very moderate with average daily temperatures ranging from about 68 to 81 degrees Fahrenheit. Average annual rainfall in the Po'ipū area amounts to about 40 to 45 inches, with summer months being the driest. In the greater Kōloa-Po'ipū area, rainfall ranges from 30 inches at the coast to 200 inches in mountain areas (NOAA, 2003).

3.1. GEOLOGY AND TOPOGRAPHY

3.1.1. Regional Geology

The island of Kaua'i is geologically one of the oldest of the eight main Hawaiian Islands and structurally complex islands in the State. The Island is made up largely of a huge basaltic shield volcano, the Kaua'i shield, that last became active approximately four (4) million years ago. The caldera of the shield volcano is ovoid (egg-shaped), approximately 12 miles long from northeast to southeast, and 10 miles wide from northwest to southwest. The Island still has the

roughly circular outline of the original circular dome, even though it has been profoundly affected by collapse, faulting, erosion, and later volcanism.

The Island's land mass was formed by two (2) major volcanic lava flows which are: 1) Waimea Volcanic Series and 2) Kōloa Volcanic Series. The Waimea Volcanic Series, which is more than 3 million year old, refers to the flows that formed the original volcanic shield and caldera of the island. It also includes the portion that built the main mass of the shield outside the caldera which is called the Napali formation.

The Kōloa Volcanic Series, which is less than 1.5 million years old, refers to subsequent flows that overlaid much of the Waimea Volcanic Series formations on the lower slopes of the Island. The Kōloa Volcanic Series consists of a range of formations from olivine basalt to nepheline basalt. These rocks are much less permeable than some of the rocks of the Waimea Volcanic Series as they were deposited as nearly flat layers that tend to be massive and devoid of permeability elements. Presumably, the Kōloa eruptions were fed by dikes, but very few have been found, probably because erosion has not yet cut deeply enough to expose them. The Regional WRF project area is located within the Kōloa Plain, which formed over lava flows from the post-erosional Kōloa Volcanic Series (Macdonald et al. 1983).

3.1.2. Topography

The topography of the Project Area is generally characterized as relatively flat and gently sloping downward from mauka to makai. The Project Area ranges in elevation from approximately 200 feet above mean sea level (msl) near Weliweli Road in the vicinity of Kōloa town down to approximately 40 feet above msl at the existing Po'ipū WRF. The proposed Regional WRF and WWPS sites are all relatively flat and contain no unique or unusual topographic features.

The proposed Regional WRF site is located at an elevation of approximately 174 feet above the msl. The proposed Kōloa WPS site is located at an elevation of approximately 40 feet above msl. The proposed Crater Tank WWPS site is located at an elevation of approximately 141 feet above msl. The proposed Easter WWPS site is located at an elevation of approximately 66 feet above msl.

3.1.3. Probable Impacts and Mitigation Measures

No significant impacts to the present geology and topography associated with the affected project sites are anticipated as a result of the construction and operation of the proposed Regional WRF. Similarly, no significant impacts to the immediate surrounding properties are anticipated from the construction of the proposed project. There are no unique or significant geological land formations present at the site of the Regional WRF since this site consists of portions of the former Kōloa Mill. This project site is relatively flat and would not require major cut or fill activities that could significantly alter present geologic land forms. Therefore, the

present topography associated with the site for this facility will essentially remain as under existing conditions.

There are no unique or significant geological land formations present at the sites of the wastewater pump stations or along the proposed collection system routes. These routes would involve existing roadways or areas adjacent to roadways. Other areas consist of cane haul roads or other corridors created for other utilities such as a County waterline near the Villages WWPS. No major cut or fill activities are anticipated for the pump stations and along the sewer line routes that would significantly alter present geologic land forms or existing topographic conditions.

The relatively flat terrain of the affected areas should minimize the amount of grading required during construction activities, and therefore result in minimal or minor modifications of the existing topography. Design plans developed for pad areas for structures or pump stations would try to achieve a balanced cut and fill condition to minimize disturbances to the area's topography and soils as practical. Areas planned for these pump stations are already small in size of about 0.25 acres or less which would minimize the amount of disturbance. Trenches excavated for the installation of sewer lines will either be repaved if within roadways or backfilled to existing site conditions. Agency review and approval of design plans as part of ministerial reviews and permit approvals would further assist in mitigating effects on topography.

3.2. Soils

Soil suitability studies completed for the Hawaiian Islands describe the physical attributes and the relative productivity of different land types for agricultural uses. Relevant studies include the: 1) U.S. Department of Agriculture, Natural Resources Conservation Service's Soil Survey GIS data, 2) University of Hawai'i Land Study Bureau's (LSB) Detailed Land Classification, and 3) the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i. The soil classifications and types in the project area are described.

3.2.1. NRCS Soil Survey

Included in NRCS's Soil Survey of Islands of Kaua'i, Oahu, Maui, Molokai, and Lanai, State of Hawai'i, are general and detailed soil maps. The general maps show soil associations by area while the detailed maps classify the soil by soil series and phases. As indicated by the general soil survey map for the Island of Kaua'i, the project corridor is situated within one soil association which is the Waikomo-Kalihi Kōloa (SCS 1972). Figure 3-1 graphically illustrates the extent of five (5) specific soil types that occur throughout the project area. Descriptions of these soil types adapted from the NRCS Soil Survey are discussed.

The Waikomo-Kalihi Kōloa association is defined as soil with deep, gently sloping to steep, well-drained soils that have fine textured or moderately fine textured subsoil and deep, nearly level, poorly drained, bottom-land soils that have fine texture subsoil. This association consists of well-drained, fine-textured soils that developed in material weathered from basic igneous rock

and poorly drained, very fine textured soils that developed in alluvium. These soils are gently sloping to nearly level and are on the uplands and bottom lands of Southeast Kaua'i.

This particular association is comprised of the Waikomo Series, the Kalihi Series, and the Kōloa Series. The Waikomo series soils have a surface layer of dark-brown to very dark grayish-brown, very firm stony silty clay. The subsoil is reddish-brown to dark yellowish-brown, firm heavy silty clay loam. The substratum is hard basic igneous rock.

The Kalihi series soils have a surface layer of very dark-gray to mottled dark-brown, firm clay. The subsoil is dark-gray, mottled, firm clay. The substratum is grayish-brown and dark-gray, firm clay.

The Kōloa series soils have a surface layer of dark reddish-brown, firm stony silty clay. The subsoil is dusky-red to dark reddish-brown, firm silty clay. The substratum is hard rock. The natural vegetation for these soils is lantana, koa haole, java plums, cactus, swollen finger grass, Bermuda grass, and guinea grass. Most typically, the soils in this association are used for irrigated sugarcane, pasture, and wildlife habitat.

1. **Waikomo stony silty clay (Ws)**. This soil is common throughout the western portion of the Project Area. In a representative profile, the surface layer is very dark grayish-brown stony silty clay about 14 inches thick. The subsoil, about 6 inches thick, is reddish-brown stony heavy silty clay loam that has subangular and angular blocky structure. The substratum is hard rock. The soil is neutral to mildly alkaline throughout. Permeability is moderately slow, runoff is slow, and the erosion hazard is slight. It is used for sugarcane, pasture, wildlife habitat and homesites. The available water capacity is about 1.0 inch per foot of soil. Except for cracks in the rock, roots penetrate to a depth of no more than 20 inches. The slope ranges from 0 to 6 percent.
2. **Waikomo very rocky silty clay (Wt)**. This soil occurs throughout the eastern portion of the Project Area and is similar to Waikomo stony silty clay. Rock outcrops cover 3 to 25 percent of the surface. The soil has limited use due to stoniness and unfavorable texture; ranging from very stony, very rocky, to extremely stony or extremely rocky. Therefore, it is usually used for pasture, wildlife habitat and home sites. The slopes range from 0 to 35 percent.
3. **Fill land (Fd)**. This soil type is found along a small section of the northwest portion of the Project area and consists mostly of areas filled with bagasse and slurry from sugar mills. A few areas are filled with material from dredging and soil excavations. Generally, these materials are dumped and spread over marshes, low-lying areas along coastal flats, coral sand, coral limestone, or areas shallow to bed rock. This type of land is mostly used for the production of sugar cane.

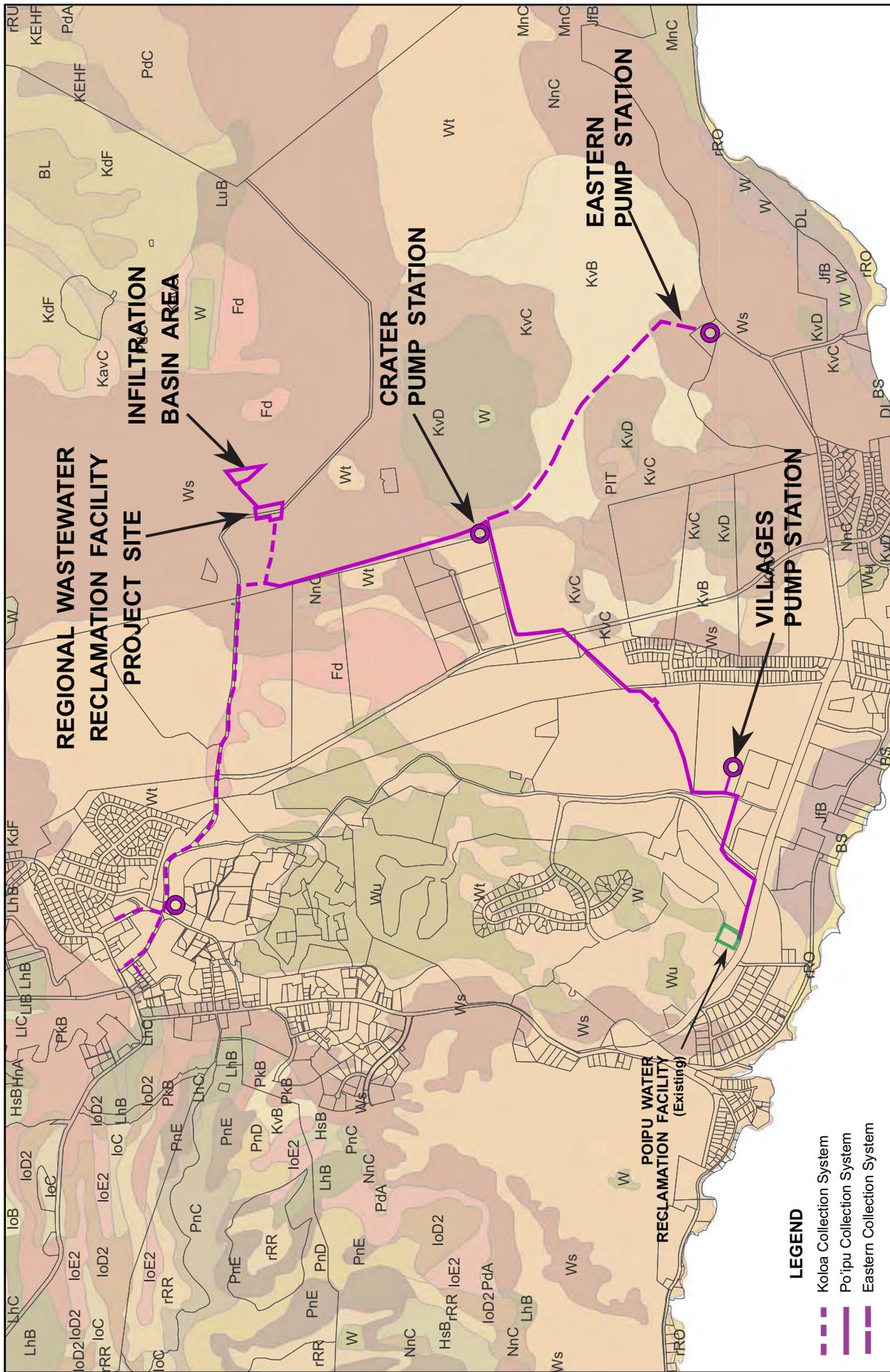


FIGURE 3-1
NRCS SOIL SURVEY

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

- LEGEND**
- Koloa Collection System
 - Po'ipu Collection System
 - Eastern Collection System



4. **Kōloa stony silty clay, 3 to 8 percent slopes (KvB)**. This soil typically occurs in upland slopes and is prevalent in the southeastern portion of the Project Area. In a representative profile, the surface layer is dark reddish-brown stony silty clay about 7 inches thick. The subsoil, about 13 inches thick, is dark-red and dark reddish-brown stony silty clay that has subangular blocky structure. The substratum is hard rock and the soil is slightly acid to neutral throughout the profile. Permeability is moderately slow, runoff is slow, and the erosion hazard is slight. The available water capacity is about 1.8 inches per foot of soil. Roots penetrate to the bedrock.
5. **Kōloa stony silty clay, 8 to 15 percent slopes (KvC)**. This soil underlies a small section of the central portion of the Project area and is very similar to KvB. On this soil, runoff is medium and the erosion hazard is moderate. Both KvC and KvB were formerly used for sugarcane cultivation.

The NRCS Soil Survey includes a Land Capability rating of soil types according to eight levels of productivity for commercial cultivation. Class I soils have few limitations that restrict their use. Class VIII soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife habitat, or water supply, or to esthetic purposes. The five soil types within the project corridor have varying capability class ratings ranging from Class IIe (with irrigation) to Class VI (without irrigation). In general, the soils within the project corridor have severe to very severe limitations that make them generally unsuitable for cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat (SCS 1972).

3.2.2. Land Study Bureau

The University of Hawai'i Land Study Bureau's (LSB) *Detailed Land Classification – Island of Kaua'i* evaluates the quality or productive capacity of certain lands on the Island for selected crops and overall suitability in agricultural use (LSB 1965). A five-class productivity rating system is established, with "A" representing the class of highest productivity and "E" the lowest.

The majority of the Project Area located west of Ala Kinoiki Road is classified as "E" rated soils, which is considered very poor characteristics for productive agricultural areas. Within the area east of Ala Kinoiki Road, the majority of the Project Area is classified as "B" rated soils, which indicates a high suitability for productive agriculture. Smaller areas are classified as "D" rated soils, which is considered poor characteristics for productive agricultural areas. The existing Kōloa Mill site and immediate surrounding area is classified as "U" which indicates an urban classification. Figure 3-2 shows the project improvements in relation to these soil ratings (LSB 1965).

3.2.3. Agricultural Lands of Importance to the State of Hawai'i

The State Department of Agriculture's *Agricultural Lands of Importance to the State of Hawai'i* (ALISH), established a classification system for identification of agriculturally important lands to the State of Hawai'i (DOA, 1977). Three classes of lands were established for the

State of Hawai'i, primarily, but not exclusively, on the basis of soil characteristics. The three classes of ALISH lands are: 1) prime, 2) unique, and 3) other. Lands not included under this system are "unclassified". Figure 3-3 shows the project improvements in relation to these classifications.

Based on the ALISH map shown, the portion of the Project Area situated west of Ala Kinoiki Road is Unclassified. The portion of the Project Area situated east of Ala Kinoiki Road is classified as "Prime Agricultural Land", "Other Important Agricultural Land", and Unclassified land. The existing Kōloa Mill site and immediate surrounding area is designated as Unclassified.

3.2.4. Probable Impacts and Mitigation Measures

Construction of the proposed wastewater facility along with collection system improvements will involve some clearing, grubbing, grading, and excavation of project areas. Such activities will inevitably involve site disturbance on a short-term basis that could result in soil erosion during significant storm events. There should be minimal impacts occurring on soils at the affected project sites as a result of construction activities, and such effects would be temporary. The long-term operation of the proposed Regional WRF should have minimal if any long-term effects on existing soils.

Construction of the regional wastewater facility at the Kōloa Mill site would require minimal changes to the existing topography and site conditions because it is already flat and existing mill structures are planned for adaptive reuse (bagasse building and water tank). Additional pads necessary for other structures associated with this facility would require minimal changes to site conditions. Construction work would thus not require large quantities of cut and fill activities.

Proposed sites for the wastewater pump stations would use a very small and limited area of 0.25 acres or less. Some grubbing and excavation work would be required since the most of the pump station equipment would be located underground. However, construction of these improvements should have only a minor impact on soils. Construction of the sewer lines would involve open trench or horizontal directional drilling activities either within existing paved roadways, cane haul roads, or undeveloped areas. Such activities would disturb soils, but soils would be backfilled into the trenches and not significantly impact existing soil conditions.

Mitigation Measures

To minimize potential short-term erosion impacts during construction activities, various best management practices identifying appropriate erosion control measures would be implemented by the contractor. The specific measures developed for implementation would be established during the project's design. Such erosion control measures which could be

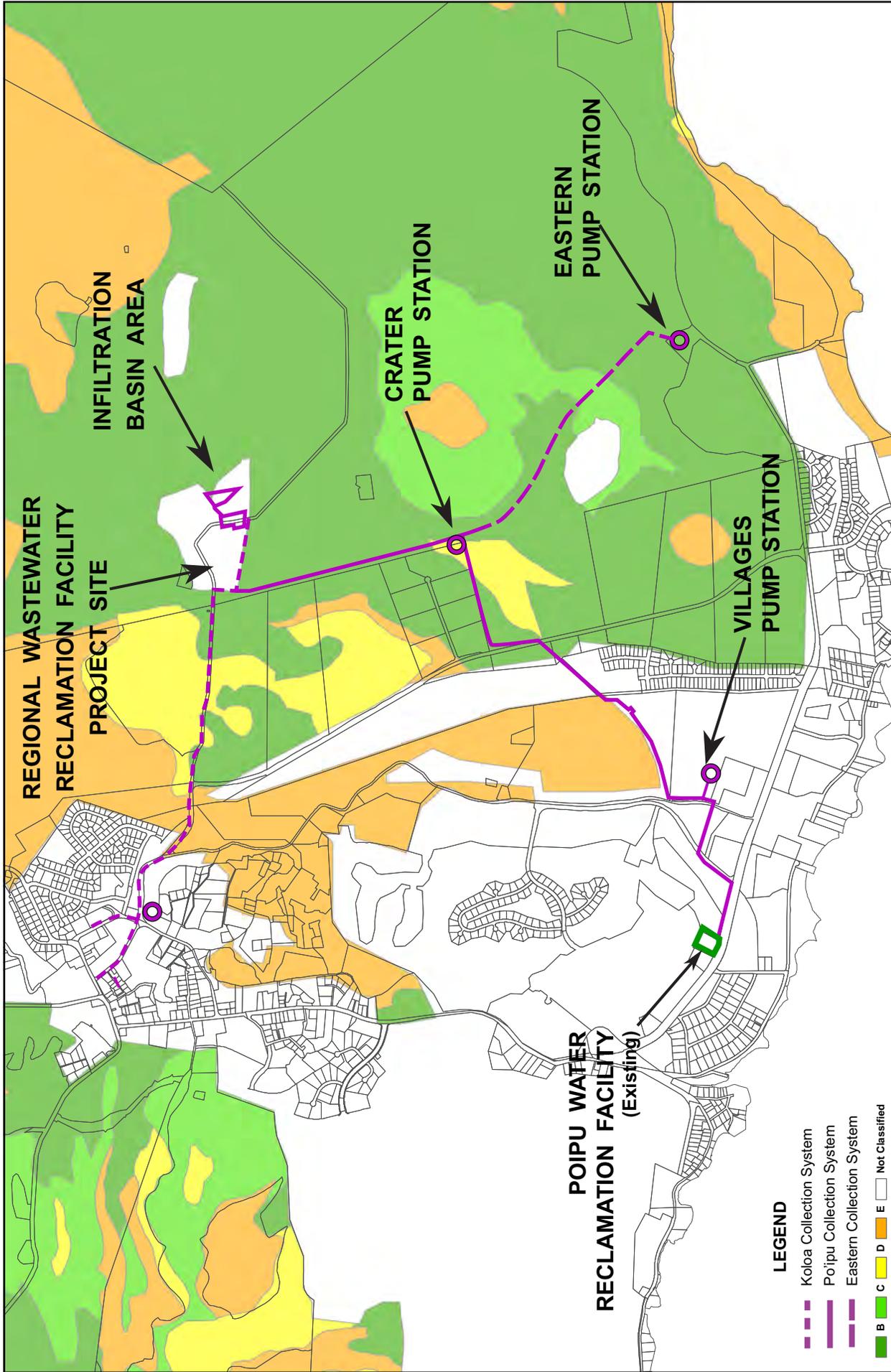


FIGURE 3-2
LAND STUDY BUREAU DETAILED LAND CLASSIFICATION

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC

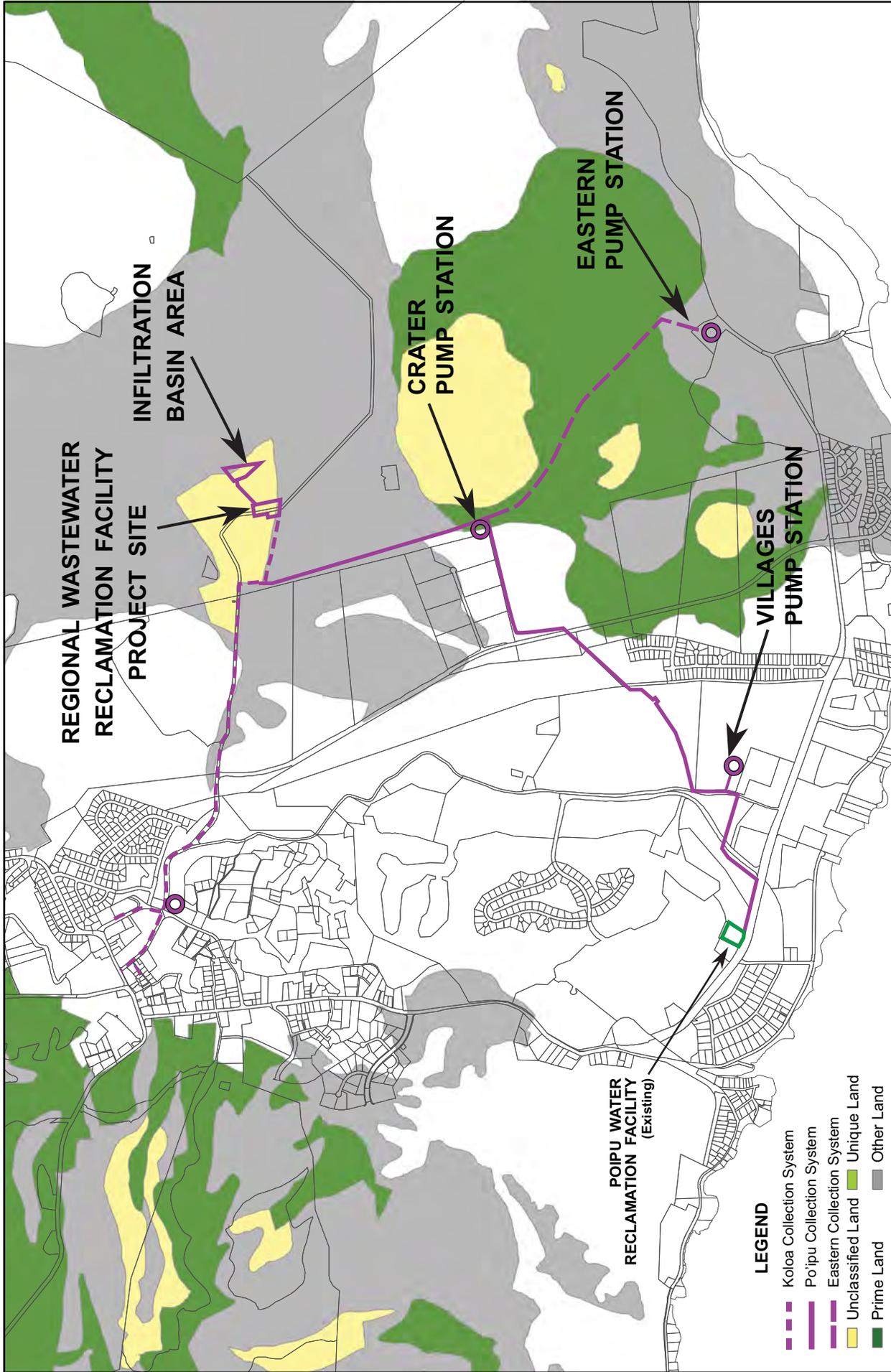


FIGURE 3-3
AGRICULTURAL LANDS OF IMPORTANCE IN THE STATE OF HAWAII

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

considered to further lessen short-term erosion impacts may include: use of temporary berms and cut-off ditches; use of temporary silt fencing and screens; thorough watering of graded areas after construction activity has ceased for the day and on weekends; or sodding or planting areas immediately after grading work has been completed.

Project design plans will be prepared during the design phase which would be submitted to pertinent agencies for their ministerial review and approval. The proposed Project will also comply with the pertinent State and County regulations addressing such areas. Grading activities will comply with the State DOH's Title 11, Chapters 54 and 55, HAR regarding water quality standards and water pollution control, respectively, and the County's Grading Ordinance. The grading ordinance includes provisions related to reducing and minimizing the discharge of pollutants association. Since the area of soil disturbance will exceed one (1) acre, pursuant to Chapter 11-55, HAR, a National Pollutant Discharge Elimination System (NPDES) Permit for Construction Storm Water Activities will be required from the State DOH prior to the start of construction of the proposed improvements.

3.3. NATURAL HAZARDS

This section addresses those natural hazards applicable to the project which consists of: 1) earthquakes, 2) hurricane hazards, and 3) tsunamis and flooding. Volcanic hazards in the region of the Project Area are considered minimal due to the dormant status of the Waialeale volcano making an eruption unlikely.

3.3.1. Earthquake Hazards

Earthquakes in the Hawaiian Islands are primarily associated with volcanic eruptions resulting from the inflation or shrinkage of magma reservoirs beneath which shift segments of the volcano (Macdonald, et al.1983). Volcanism is the source of energy for about 95 percent of the earthquakes on Hawai'i Island. However, in the central region defined as the area encompassing the islands of Maui and Oahu, the seismicity is generally related to tectonic activity on the seafloor near the Hawaiian Islands. The northwestern region (Kaua'i-Ni'ihau) of the Hawaiian Islands has experienced tremors from earthquakes originating farther south, but no known seismic activity has originated among these islands. The earthquake risk for the northwestern islands has been evaluated as minimal. (Fletcher et al. 2002).

The Island of Kaua'i is periodically subject to episodes of seismic activity of varying intensity. Available historical data indicates that the number of major earthquakes occurring on Kaua'i have generally been less and of lower magnitude compared with other islands such as Hawai'i (DBEDT 2001, Furumoto, et al. 1973). However, earthquakes cannot be predicted with any degree of certainty or avoided, and an earthquake of sufficient magnitude (greater than 5 on the Richter Scale) may cause damage to the proposed project improvements.

Probable Impacts and Mitigation Measures

Although difficult to predict, an earthquake of sufficient magnitude causing structural or other damage to this project may occur in the future. However, except for the Island of Hawai'i, the Hawaiian Islands are not situated in a highly seismic area subject to numerous earthquakes (Macdonald et al. 1983). Most of the earthquakes that have occurred were volcanic earthquakes causing little or no damage (USGS 1997).

Earthquakes can pose a threat to communities and could potentially cause large economic losses on all islands. The Island of Kaua'i is not situated in a highly seismic area subject to historic or numerous earthquakes. The County of Kaua'i's Uniform Building Code seismic hazard rankings is 2A. There is a possibility of future earthquakes occurring on the Island of Kaua'i based upon past events, therefore, the project may be subject to damage from an earthquake of sufficient magnitude occurring in the area.

While the possibility of earthquakes on Kaua'i has been lower than other islands, potential damage to the Regional WRF and associated collection system improvements (pump stations and sewer lines) may occur from an earthquake of sufficient magnitude. However, damages to these structures will be mitigated and minimized by complying with appropriate State and County design standards and requirements. Thus, the risk of potential damage to the proposed project will not be more than other existing land uses or infrastructure facilities on the island.

3.3.2. Hurricane Hazards

In any given year, one or more hurricanes can be expected to occur in the central North Pacific Ocean. Although hurricanes occur infrequently in the immediate vicinity of Hawai'i, they do occasionally pass near the islands. The Island of Kaua'i has historically received a greater threat of damage from hurricanes as compared to other islands. Recent examples included Hurricane Iwa, which passed within 30 miles of Kaua'i in 1982, and Hurricane Iniki, which passed directly over Kaua'i in 1992.

A hazard mitigation report prepared by the Federal Emergency Management Agency after Hurricane Iniki in 1992 determined that nine hurricanes approached within 300 nautical miles (about one day's travel time) of the Hawaiian Island's coastlines between 1970 and 1992. Most hurricanes affecting the islands have focused on Kaua'i. Based upon a tracking of hurricanes since 1950, there appears to be no geographical or meteorological reasons why hurricanes miss the other islands but have tended to steer toward Kaua'i (FEMA 1993).

Probable Impacts and Mitigation Measures

There are three (3) major elements of a hurricane which make it hazardous to structures, property, and residents. They are: 1) strong winds and gusts, 2) large waves and storm surge, and 3) heavy rainfall (FEMA 1993). Two (2) of these elements, strong winds and gusts and heavy rainfall, are more applicable in possibly affecting the project improvements. Because the

Regional WRF is situated well inland, it would not be susceptible to damages from large waves and storm surge. The Villages and Eastern pump stations are also located a considerable distance inland making them less susceptible to damages from large waves from a hurricane.

While it is difficult to predict these natural occurrences, it is reasonable to assume that future events could likely occur given the recent record. The Project Area, as well as the rest of the Island and State, is thus no more or less vulnerable to the torrential rains and high winds associated with hurricanes.

A hurricane of significant strength passing close to the island could result in damages to the Regional WRF project along with other existing infrastructure facilities and urban developments (ex. homes, businesses, etc.) in the Kōloa to Po'ipū region. During such of a hurricane event, the project would be subject to strong winds and gusts as well as heavy rainfall. Therefore, the Regional WRF buildings as well as the associated pump stations have the potential to receive some damages since these involve above ground structures.

Such conditions could also cause damages to the wastewater pump stations planned which would have some structures situated above ground. However, most of the pump station equipment would be located underground and consequently less susceptible to damages from high winds and heavy rainfall. Sewer line improvements would also be situated underground and should thus have less chance of receiving damages from these factors.

To minimize and mitigate damages from the effects of a hurricane, the project improvements would be constructed using acceptable materials and in accordance with appropriate State and County design requirements and standards. Thus, the risk of potential damage from the effects of a hurricane should be no more than other existing infrastructure facilities and urban developments (ex. hotels, residences, businesses, roadways, etc.) in the region.

3.3.3. Tsunami Hazards and Flooding

Tsunamis are large, rapidly moving ocean waves triggered by a major disturbance of the ocean floor. Earthquakes, submarine landslides, or volcanic eruptions can trigger tsunamis. About 50 tsunamis have been reported in the Hawaiian Islands since the early 1800s. Seven (7) caused major damage, and two (2) of these were locally generated.

The tsunami evacuation zone based upon State Civil Defense maps is located along a 200- to 600-foot-wide swath of the shoreline area of the Kōloa-Po'ipū Region. At its closest point, the tsunami evacuation zone is located approximately 750 feet seaward of the nearest portion of the Project Area, situated along Po'ipū Road. Exhibit 3-1 shows this evacuation area.

The Project Area is overall relatively free from flood hazards. According to the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA), almost the entire area where project improvements are planned is located within Zone “X”. Zone X is defined as areas outside the 0.2 percent annual chance floodplain (FEMA 1993).

In Kōloa town, there is a short segment of the Kōloa collection system that would have a sewer line situated

within a flood designated area. This involves a segment extending from Weliweli Road eastbound along a private driveway identified as Yamada Road to service an existing commercial area. This flood area is associated with Waikomo Stream that runs in a mauka to makai direction through the western half of Kōloa town. This area is designated both Zone X (flood areas with 0.2 percent annual chance flood) and Zone AE. Figure 3-4 graphically shows the flood designations within the project area, and a summary of the flood designations is provided.

- Zone AE: “Special flood hazard areas inundated by the 100-year flood with base flood elevations determined.”
- Zone X: “Other flood areas determined to have areas of 0.2% annual chance flood, areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.”
- Zone X: “Other areas determined to be outside the 0.2% annual chance floodplain.”

Probable Impacts and Mitigation Measures

The proposed project is not anticipated to significantly change or affect the risk of flood hazard in the area. With the exception of a short sewer line segment along Yamada Road in Kōloa town, the project improvements are located in areas outside the 0.2 percent annual chance floodplain. Therefore, improvements associated with the regional treatment facility and pump stations should not affect flood hazards in the area.

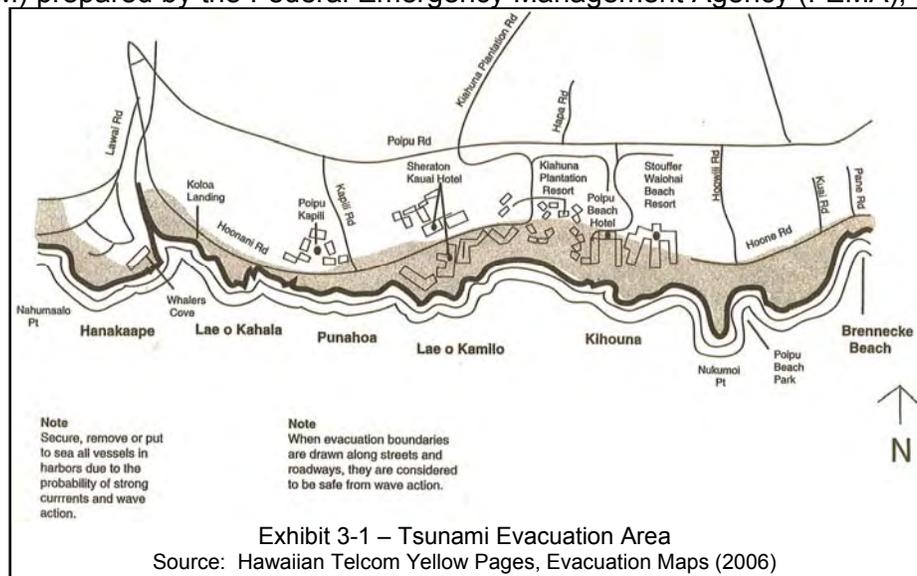
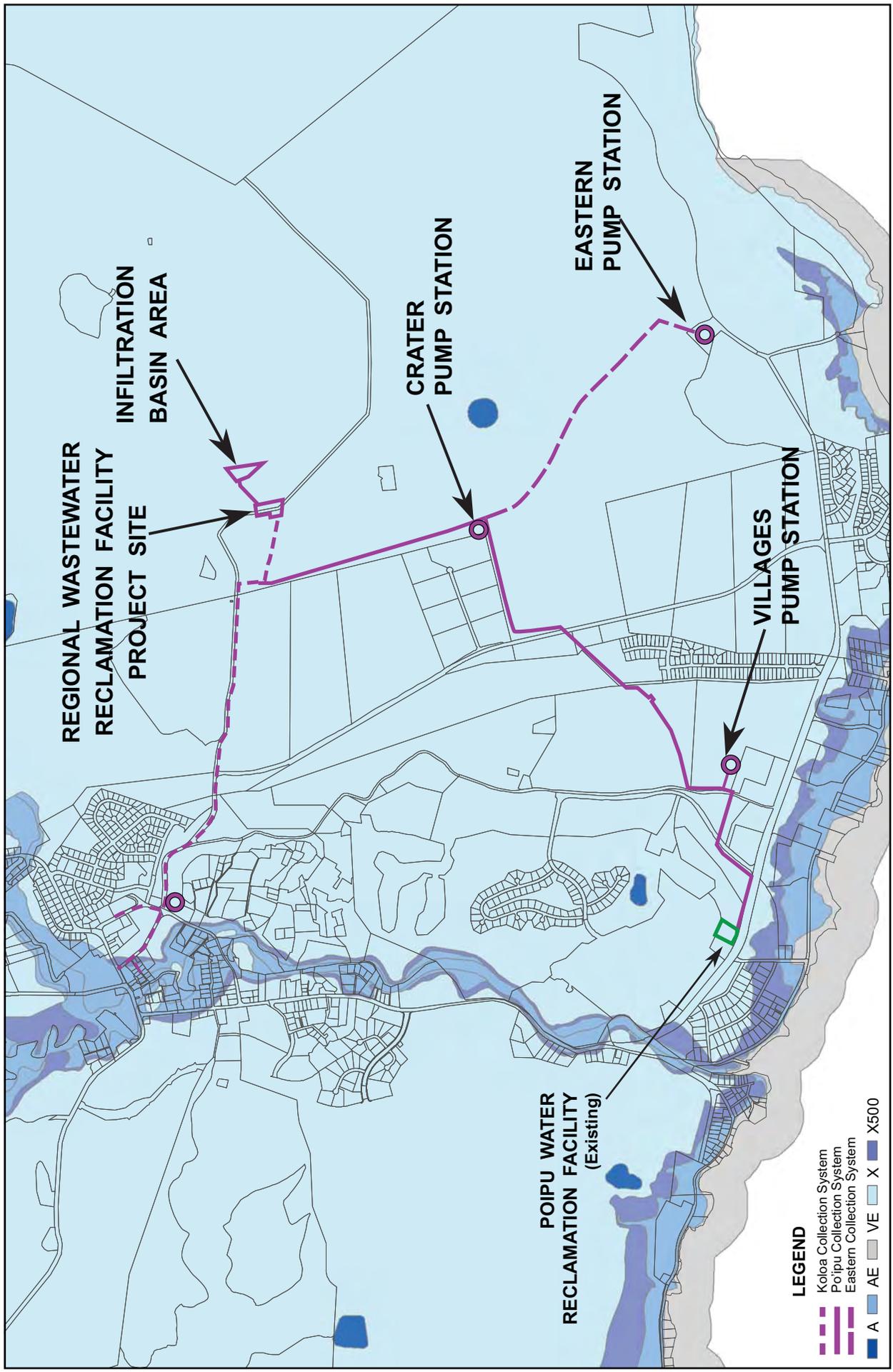


FIGURE 3-4
FLOOD INSURANCE RATE MAP FOR PROJECT AREA

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC



The sewer line collection systems would be located underground and should thus have minimal, if any, effect on the flood hazards in the area. The majority of the collection system routes are within agricultural areas that are predominantly fallow at this time. The short sewer line segment within flood areas would be situated underground within Yamada Road. This private road serves as vehicle access to a parking area for existing commercial uses. Once installed, the roadway will be repaved. Therefore, it is not expected to affect the flood hazard in that area.

To further minimize effects from flooding within the project area, the treatment facility and associated structures would be designed in conformance to applicable State and County design standards. Design plans would also be submitted to pertinent agencies for ministerial review and approval during the project's design phase.

3.4. HYDROLOGY

This section discusses the regional hydrology present in the project area which includes ground water and surface water resources.

3.4.1. Hydrogeological Resources

The State of Hawai'i, Department of Land and Natural Resources (DLNR), Commission on Water Resource Management (CWRM) has established groundwater hydrologic units and an aquifer coding system to provide a consistent basis for managing ground water resources. The Project Area is located within the Kōloa Aquifer System Area (aquifer system code 20101). For purposes of managing groundwater withdrawals, CWRM has adopted the sustainable yield of 30 mgd for the Kōloa Aquifer System Area's sustainable yield. Recent estimates indicate that current groundwater withdrawals from the system total approximately 3 mgd.

The surface geology of the Kōloa Aquifer System consists mainly of post-erosional Kōloa Volcanics overlying older thin-bedded shield-building flank lavas of the Napali Member and dike-intruded caldera lavas and breccia of the Haupū Member. The Kōloa Volcanics were erupted from approximately 23 northeast-trending vents within the boundaries of the System. Kōloa Volcanics exposed include nephelinitic to alkalic basalt lava flows and pyroclastic deposits interbedded with boulder conglomerates. These flows and tephra deposits mantle existing topography and give the area a gentle geomorphic expression.

Basal aquifers occur within the Napali Member Basalts and Kōloa Volcanics. Water level records of wells drilled below Kōloa Volcanics, into flank flows show head elevations ranging from 30-140 feet above mean sea level, suggesting mixed basal and high-level conditions in wells and drilled holes near Lāwa'i. Deeply buried dikes may control groundwater levels. Perched groundwater occurs in the Kōloa Volcanics as small discontinuous aquifers that vary in thickness and size. Large and small streams in the Kōloa System may receive a portion of flow from perched spring discharge. Because most of the rainfall in the System infiltrates into the

Kōloa Volcanics, much of the groundwater in the System may be perched. High-level dike water has not been clearly identified but probably exists.

The Underground Injection Control (UIC) program, administered by the State DOH's Safe Drinking Water Branch, serves to protect the quality of Hawai'i's underground sources of drinking water from chemical, physical, radioactive, and biological contamination that could originate from injection well activity. The boundary between non-drinking water aquifers and underground sources of drinking water is generally referred to as the "UIC Line". Within the areas located above (mauka) the UIC Line, the underlying aquifers are considered a drinking water source. Within the areas located below (makai) the UIC Line, the underlying aquifers are not considered a drinking water source.

The Project Area is mostly located below (makai) the UIC Line, except for the existing Kōloa Mill site which is located above (mauka) the UIC Line. However, reuse can occur above the UIC line.

Probable Impacts and Mitigation Measures

Construction of the regional facility and associated collection system improvements is expected to have minimal impacts on the surrounding groundwater system. Most of the improvements would occur within the existing roadways right-of-way which includes already paved areas. Other collection system improvements would be within existing cane haul roads, along existing utility easements, and through former plantation agricultural land. The treatment facility is being constructed within a site previously used for the Kōloa Mill. Affected areas are therefore not sources for important groundwater recharge such as forest reserves or other conservation areas. These improvements should thus have minimal effect on groundwater recharge and the underlying aquifer system present in this area.

The small increase in additional impervious surface created from this project would inevitably decrease the amount of localized groundwater recharge occurring. The wastewater pump stations would total less than one acre in size since each of the four sites would use 0.25 acres or less. The Eastern WWPS would also be situated within an existing wastewater treatment facility site. The treatment facility is also planned on an area of slightly less than 2 acres associated with the Kōloa Mill site. Therefore, this decrease in impervious areas from the project improvements is expected to be negligible and ultimately inconsequential to the overall function of the area's natural hydrological system.

The operational activities associated with the Regional WRF project are not likely to introduce to, nor release from the soil, any materials which could adversely affect groundwater resources. Potential impact to groundwater due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The use of PVC pipe will provide for corrosion resistance and longevity, and is more durable and resistant to breakage. Standard procedure for detecting leaks and breaks and for shutting down and repairing the

collection system will further minimize impacts. The potential for wastewater spills impacting groundwater underlying the proposed facility improvements during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The proposed regional collection and treatment system should have a beneficial impact on groundwater resources since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs, which would currently produce R-2 (secondary) treated effluent. It would also allow for these existing systems to be phased out over time and result in the closure of their associated injection wells, most of which are located in close proximity to the shoreline. The R-1 non-potable water will also be an alternative non-potable water source and relieve some of the irrigation demand for other surface water sources.

3.4.2. Surface Water

The State DLNR CWRM has established surface water hydrologic units (watershed units) and a surface water hydrologic unit coding system to provide a consistent basis for managing surface water resources. The Project Area spans two (2) watershed units. The majority of the Project Area is located within the Waikomo Surface Water Hydrologic Unit (unit code 2049). Sections of the Project Area on the north and east are within the Mahaulepu Surface Water Hydrologic Unit (unit code 2048).

Mean annual rainfall in this region varies from 30 inches at the coast to greater than 200 inches at Puu Kapalao, north of the Project Area. Although precipitation is high, stream discharge is relatively low. Seven (7) years of measured stream flow (1963-70) at the U.S. Geological Survey's (USGS) Lāwa'i Stream Gage No. 16052500 averaged 5.28 mgd. Currently, only crest-stage recorder measurements of maximum flow are available for this gage.

Streams in the Kōloa-Po'ipū area tend to be shorter and straighter, as opposed to other Kaua'i streams that meander along considerable distances. Undoubtedly, many of the streams in the Kōloa-Po'ipū region have had their courses affected by the Kōloa Volcanics. Waikomo Stream is located in the Project vicinity just east of Po'ipū Road. The streams are very much interconnected with the agricultural irrigation system built over a century ago to sustain sugar cane cultivation and processing of the cane at the Kōloa Mill. In addition to moving water within the Waikomo watershed, the Kōloa irrigation system is also connected to the Hule'ia Stream system to the North. The Kōloa irrigation system is now in a state of disrepair and some components may have been diverted to other crops and some are no longer in use.

Other surface water features in the Project vicinity include the Waita Reservoir, which is the largest man-made surface water feature in the area and is approximately 3,000 feet south of

the Project Area. Two other reservoirs in the watershed were drained recently because of concerns that the dams were at risk of failure.

In January 2009, AECOS, Inc. inspected the site of the Kōloa Mill pond of which a portion of it would be used for the infiltration basin. It was observed that this settling basin is now completely overgrown with Guinea grass except where ongoing grading activity is occurring to recover soil from the solids settled in the basins, and the ponds no longer exist. What water was observed at the site was ponded rain water in an isolated depression or basin made by the recent soil recovery activities.

Probable Impacts and Mitigation Measures

No aquatic habitats are present in the project area since all “water features” along proposed routes are normally dry irrigation ditches. Standing water at the proposed facility site east of Kōloa Sugar Mill is a temporary impoundment providing, at most, limited breeding habitat for aquatic insects such as mosquitoes. No state or federally listed endangered or threatened (DLNR, 1998; Federal Register, 2005; USFWS, 2005, 2009a) or native migratory (amphidromous) aquatic species were observed in the Project area during the January 2009 site visit. However, the project’s design would take into consideration that an old irrigation system may carry flowing waters during heavy rainfall events, and this flow has the potential to provide a connection to natural waterbodies in the watershed.

Construction activities associated with the proposed wastewater system improvements are not likely to significantly impact surface water resources in the Project vicinity. Potential impacts to the quality of surface waters in streams, reservoirs, and irrigation ditch systems during construction of the proposed facility improvements will be mitigated by adherence to State and County water quality regulations governing grading, excavation, and stockpiling.

A NPDES General Permit for Storm Water Associated with Construction Activity, administered by the State DOH will be required to control storm water discharges. Mitigation measures will be instituted following site-specific assessments, incorporating appropriate structural and/or non-structural BMPs such as silt fences and minimizing time of exposure between construction and re-vegetation to control erosion and to minimize environmental impacts to water quality and aquatic biota down slope from the project sites.

Potential impact to surface waters due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The use of PVC pipe will provide for corrosion resistance and longevity, and is more durable and resistant to breakage. Standard procedure for detecting leaks and breaks and for shutting down and repairing the collection system will further minimize impacts. The potential for wastewater spills impacting surface waters during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The proposed regional collection and treatment system would have a beneficial impact on surface waters since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs, which currently produce R-2 (secondary) treated effluent. It would also allow for these existing systems to be phased out over time and result in the closure of their associated injection wells, most of which are located in close proximity to the shoreline.

3.4.3. Coastal Waters

Coastal waters along the Po'ipū area of Kaua'i are classified as Class A and Class AA by the State DOH. Class A waters are found east of Makahuena Point toward Nawiliwili Bay. Class AA waters are found along the approximately two (2) miles of coastline between Makahuena Point and Hoai Bay, just west of the Waikomo Stream estuary. Class A waters are classified by the DOH with the objective that "their use for recreational purposes and aesthetic enjoyment be protected. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class" (HAR Title 11, Chapter 54, Water Quality Standards).

Class AA waters are recognized as high quality coastal waters by the DOH, with the objective that "these waters remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused sources or actions" (HAR Title 11, Chapter 54, Water Quality Standards).

Coastal waters of the Pacific Ocean are located approximately 0.25 miles from the makai-most section of the Project Area along Po'ipū Road. The proposed Regional WRF is located approximately 2 miles inland from the coast.

Probable Impacts and Mitigation Measures

Construction activities associated with the proposed wastewater system improvements are not likely to significantly impact surface water resources in the Project vicinity. Potential impacts to the quality of coastal waters during construction of the proposed facility improvements will be mitigated by adherence to State and County water quality regulations governing grading, excavation, and stockpiling. A NPDES General Permit for Storm Water Associated with Construction Activity, administered by the State DOH will be required to control storm water discharges. Mitigation measures will be instituted following site-specific assessments, incorporating appropriate structural and/or non-structural BMPs such as silt fences and minimizing time of exposure between construction and re-vegetation to control erosion and to minimize environmental impacts to water quality and aquatic biota downslope from the project sites.

Potential impact to coastal waters due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The use of PVC pipe will provide for corrosion resistance and longevity, and is more durable and resistant to breakage. Standard procedure for detecting leaks and breaks and for shutting down and repairing the collection system will further minimize impacts.

The potential for wastewater spills impacting coastal waters during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The proposed regional collection and treatment system would have a beneficial impact on coastal waters since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs, which currently produce R-2 (secondary) treated effluent. It would also allow for these existing systems to be phased out over time and result in the closure of their associated injection wells, most of which are located in close proximity to the shoreline.

3.4.4. Water Quality

Because water was not present at the Project Site at the time of the survey, AECOS did not collect any samples for water quality analysis, however, AECOS and the Hawai'i Department of Health have collected and analyzed water quality data from Waikomo Estuary over the last 20 years. Mean temperature and pH values recorded in Waikomo Watershed are typical of coastal plain streams and estuaries. The measured conductivity values are within the range of expected values, with stations that have higher conductivity levels demonstrating greater groundwater input.

The salinity values measured in Waikomo Estuary range mostly from freshwater (8 ppt) to seawater (37 ppt), with a mean value of 31 ppt. These are results typical of a slightly brackish system. The man dissolved oxygen (DO) saturation levels measured in the sluggish flow of Waihohonu Stream and Oma'ō Stream are low. The geometric means of turbidity levels measured throughout the watershed are high, although the geometric means of TSS levels are not. The geometric mean ammonia concentration measured in Waihohonu Stream is high, but the geometric means of nitrate + nitrite, total nitrogen, and total phosphorus concentrations are fairly low.

The opposite is true in Waikomo Stream and Ōma'ō Stream where the geometric mean ammonia concentrations were low, but the geometric means of nitrate + nitrite, total nitrogen, and total phosphorus concentrations were high. Waikomo Estuary monitoring efforts show typically low bacterial content, although high concentrations are evident on certain sampling events.

Overall, the streams in Waikomo Watershed, including Waihohonu Stream, Ōma'ō Stream, and Waikomo Stream, appear to be somewhat degraded. Years of modifications for agricultural uses have impacted stream water quality, flow characteristics, and biotic composition. Waikomo Stream is listed on the Hawai'i Department of Health (HDOH) 2006 list of impaired waters in Hawai'i, prepared under Clean Water Act §303(d). This listing indicates that the stream may not meet the Hawai'i Water Quality Standards, potentially exceeding the wet season water quality criteria for nitrates, Total N, and turbidity (HDOH, 2006).

Remnants of the Kōloa irrigation system, including mill settling basins, siphons, ditches, and flumes remain in the landscape of the project area. Ditches, flumes, ponds, and reservoirs that are used solely for irrigation, do not overflow into any other regulated waters, are not defined as "Waters of the U.S." in 40 CFR Part 122.2, and are not designated as "State Waters" in the Hawai'i Revised Statutes §342D-1, are not regulated under the Clean Water Act and Hawai'i Administrative Rules §11-54. However, while the irrigation system itself may not be considered "waters of the U.S." or "State Waters," the policy of water quality anti-degradation in HAR §11-54-1 has been established to ensure that activities do not degrade the water quality of regulated waterbodies, such as Waikomo Stream or the Pacific Ocean.

Probable Impacts and Mitigation Measures

Construction and operation activities from the Project are not likely to introduce to, nor release from the soil, any materials which could adversely affect water quality.

Construction activities associated with the proposed wastewater system improvements are not likely to significantly impact water quality in the Project vicinity. Potential impacts to water quality during construction of the proposed facility improvements will be mitigated by adherence to State and County water quality regulations governing grading, excavation, and stockpiling. A NPDES General Permit for Storm Water Associated with Construction Activity, administered by the State DOH will be required to control storm water discharges. Mitigation measures will be instituted following site-specific assessments, incorporating appropriate structural and/or non-structural BMPs such as silt fences and minimizing time of exposure between construction and re-vegetation to control erosion and to minimize environmental impacts to water quality and aquatic biota downslope from the project sites.

Potential impact to water quality due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The use of PVC pipe will provide for corrosion resistance and longevity, and is more durable and resistant to breakage. Standard procedure for detecting leaks and breaks and for shutting down and repairing the collection system will further minimize impacts.

The potential for wastewater spills impacting water quality during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The proposed regional collection and treatment system would have a beneficial impact on water quality since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs, which currently produce R-2 (secondary) treated effluent. It would also allow for these existing systems to be phased out over time and result in the closure of their associated injection wells.

3.5. BOTANICAL RESOURCES

Between January 7 and 9, 2009, AECOS, Inc. surveyed different easements and facility locations for the Project. This study is included in Appendix C of this document. Because the project layout is mostly linear, tending to follow existing roads (some undeveloped and/or long abandoned), the approach used was to traverse these routes on foot noting all of the species of plants encountered within about 30 feet of the route centerline.

3.5.1. Description of Existing Botanical Resources

Given the nature of the survey area—long, narrow corridors encompassing a range of habitat types—the relative abundance definitions are somewhat generalized (typically, they would reflect abundance within a given area, but this survey covered many areas and vegetation types). Because the survey included some developed area, a number of ornamentals were recorded as well. However, the survey was limited to species observed close to the road where an impact from the project might actually occur. In areas of natural vegetation, survey limits were typically extended out beyond the swath of potential adverse impacts to vegetation since construction activities and access routes needed to be taken into account.

In all, 133 species of plants were identified from various parts of the survey area. Only 6 of these (or 4.5%) are native Hawaiian plant species. All are considered indigenous which are native to Hawai'i and other Pacific Islands, as opposed to endemic species that are unique to the Hawaiian Islands. A listing of these species is provided in a table within the botanical report included in the Appendices.

As might be expected given the characteristic of the project (long, narrow corridors), the nature of the vegetation varies considerably. Much of the area consisted of improved and unimproved roadways, with the vegetation typical of ruderal weeds found along verge areas and or maintained landscaping in some of the more developed areas. Along unimproved roads, the vegetation tended to be either agricultural, pasture, abandoned agricultural fields (covered by ruderal herbs and grasses), or shrublands dominated by koa haole (*Leucaena leucocephala*). An interesting variation on the koa haole shrubland are areas of mixed koa haole and hedge cactus (*Cereus guayanus*), with an understory (ground cover) of a type of snake cactus (*Selenicereus macdonaldiae*). Virtually all of the lands crossed by the project components are

highly disturbed or have been previously highly disturbed, and no areas supporting native plant assemblages occur that would be impacted by the project.

3.5.2. Probable Impacts and Mitigation Measures

Given the highly disturbed nature of the landscape in the project area, it is not surprising that botanical resources of concern or worthy of preservation are absent. Native species of plants are generally uncommon; only 'uhaloa (*Waltheria indica*) was seen with any regularity and is a common native in dry, disturbed areas.

No listed species (USFWS, 2005, 2009a) were encountered and none is expected to occur in the areas subject to disturbance by the proposed project owing to the fact that nearly all of the routes proposed for the project pass through very disturbed vegetation or where the vegetation has been disturbed in previous decades with re-growth strongly favoring non-native invasive species.

3.6. AVIFAUNA, MAMMAL, AND INVERTEBRATE RESOURCES

An ornithological, mammalian, invertebrate, and aquatic survey of the Project Area was performed by AECOS, Inc. and their biological team. The primary purpose of this survey was to determine if there were any federally listed endangered, threatened, proposed, or candidate avian or mammalian species on, or in the immediate vicinity of the Project Area. In addition, the probability of any usage of the site by these listed species given the existing habitat the site currently supports was evaluated. A copy of this report is included in Appendix C of this document.

Survey Methods

A three-day ornithological and mammalian field survey of the property was conducted from January 7th through the 9th, 2009. A total of twenty-six (26) avian count stations were sited at approximately 300-meter intervals along the proposed wastewater easements. Eight-minute point counts were made at each station, and stations were each counted once. Counts were concentrated between 7:30 a.m. and 10:30 a.m., the peak of daily bird activity. Time not spent counting was used to search the general project area for species and habitats not detected during count sessions.

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'Ōpe'ape'a as it is know locally, all terrestrial mammals currently found on the Island of Kaua'i 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.

On January 13, 2009, AECOS field biologists conducted a reconnaissance survey of waterbodies in the lower Waikomo watershed for the proposed Regional WRF project. Of the various sites visited, only Waikomo Stream near Kōloa was found to harbor aquatic habitats.

3.6.1. Avifauna Resources

3.6.1.1 Avian Survey Results

A total of 1777 individual birds of 29 species, representing 20 separate families, were recorded during station counts. Table 3-1 includes a listing of avian species along with their status and relative abundance.

Table 3-1. Avian Species Count Results			
Common Name	Scientific Name	ST	RA
ANSERIFORMES			
ANATIDAE - Ducks, Geese & Swans			
Anserinae - Geese & Swans			
Hawaiian Goose (Nēnē)	<i>Branta sandvicensis</i>	EE	0.50
GALLIFORMES			
PHASIANIDAE - Pheasants & Partridges			
Phasianinae - Pheasants & Allies			
Black Francolin	<i>Francolinus francolinus</i>	A	0.46
Red Junglefowl	<i>Gallus gallus</i>	A	3.69
Ring-necked Pheasant	<i>Phasianus colchicus</i>	A	0.04
PELECANIFORMES			
PHAETHONTIDAE – Tropicbirds			
White-tailed Tropicbird	<i>Phaethon lepturus</i>	IB	0.04
CICONIIFORMES			
ARDEIDAE - Herons, Bitterns & Allies			
Cattle Egret	<i>Bubulcus ibis</i>	A	2.35
PELECANIFORMES			
PHAETHONTIDAE - Tropicbirds			
White-tailed Tropicbird	<i>Phaethon lepturus</i>	IB	0.04
CHARADRIIFORMES			
CHARADRIIDAE - Lapwings & Plovers			
Charadriinae - Plovers			
Pacific Golden-Plover	<i>Pluvialis fulva</i>	IM	0.54
COLUMBIFORMES			
COLUMBIDAE – Pigeons & Doves			
Rock Pigeon	<i>Columba livia</i>	A	15.42
Spotted Dove	<i>Streptopelia chinensis</i>	A	2.12
Zebra Dove	<i>Geopelia striata</i>	A	3.85
PSITTACIFORMES			
PSITTACIDAE - Lories Parakeets, Macaws & Parrots			
Psittacinae - Typical Parrots			
Rose-ringed Parakeet	<i>Psittacula krameri</i>	A	0.04
PASSERIFORMES			
ALAUDIDAE - Larks			
Sky Lark	<i>Alauda arvensis</i>	A	0.12

Table 3-1. Avian Species Count Results (continued)			
Common Name	Scientific Name	ST	RA
	SYLVIIDAE, Sylviinae – Old World Warblers		
Japanese Bush-Warbler	<i>Cettia diphone</i>	A	0.46
	TURDIDAE – Thrushes		
White-rumped Shama	<i>Copsychus malabaricus</i>	A	0.27
	TIMALIIDAE – Babblers		
Hwamei	<i>Garrulax canorus</i>	A	0.38
	ZOSTEROPIDAE – White-Eyes		
Japanese White-eye	<i>Zosterops japonicus</i>	A	3.65
	MIMIDAE – Mockingbirds & Thrashers		
Northern Mockingbird	<i>Mimus polyglottos</i>	A	0.85
	STURNIDAE – Starlings		
Common Myna	<i>Acridotheres tristis</i>	A	8.08
	EMBERIZIDAE – Emberizids		
Red-crested Cardinal	<i>Paroaria coronata</i>	A	1.19
	CARDINALIDAE – Cardinals Saltators & Allies		
Northern Cardinal	<i>Cardinalis cardinalis</i>	A	1.19
	ICTERIDAE - Blackbirds		
Western Meadowlark	<i>Sturnella neglecta</i>	A	0.81
	FRINGILLIDAE – Fringilline and Cardueline Finches & Allies		
	Carduelinae – Cardueline Finches		
House Finch	<i>Carpodacus mexicanus</i>	A	6.23
	PASSERIDAE - Old World Sparrows		
House Sparrow	<i>Passer domesticus</i>	A	0.62
	ESTRILDIDAE – Estrildid Finches		
	Estrildinae – Estrildine Finches		
Common Waxbill	<i>Estrilda astrild</i>	A	1.77
Red Avadavat	<i>Amandava amandava</i>	A	5.54
African Silverbill	<i>Lonchura cantans</i>	A	0.08
Nutmeg Mannikin	<i>Lonchura punctulata</i>	A	5.88
Chestnut Munia	<i>Lonchura atricapilla</i>	A	0.96
Java Sparrow	<i>Padda oryzivora</i>	A	0.81

Key to Table

- ST Status
- RA Relative Abundance: Number of birds detected divided by the number of count stations (26)
- EE Endangered Endemic species – native and unique to Hawai'i, and listed as endangered
- A Alien species – introduced to Hawai'i by humans, and have become established in the wild
- IB Indigenous Breeding species – native to the Hawaiian Islands, but also found elsewhere naturally
- IM Indigenous Migratory species - native to the Hawaiian Islands, but also found elsewhere naturally

Of the 29 avian species detected, one species, the Hawaiian Goose (Nēnē or *Branta sandvicensis*), is endemic to the Hawaiian Islands and is listed under both Federal and State of Hawai'i endangered species statutes. Two pairs were seen on the ground several hundred yards south of the Kōloa Mill. All four of these birds were banded. An additional nine (9) were seen flying over one of the count stations located along the wastewater collection line

connecting the Crater Pump Station with the Villages Pump Station, east of Ala Kinoiki Road. It is likely they were attracted to the fallow corn fields located south of Kōloa Mill.

Two other species detected were the White-tailed Tropicbird (*Phaethon lepturus dorothea*), and Pacific Golden-Plover (*Pluvialis fulva*) which are indigenous. The White-tailed Tropicbird is an indigenous breeding species, and the Pacific Golden-Plover is an indigenous migratory species.

A lone White-tailed Tropicbird was seen flying over the Kōloa Mill towards the mountain range separating Kōloa from Nāwilliwili, possibly the area in which this bird nests. White-tailed Tropicbirds are a pelagic seabird species that come to land only to breed, nest and raise their young. On Kaua'i, they usually nest on rocky inaccessible cliffs. This species is regularly seen soaring over inland areas on Kaua'i on a seasonal basis.

Several Pacific Golden-Plover were seen along roadways and in the more open areas within the general project area. This species is a migratory shorebird species that nests in the High Arctic, returning to warmer central and Tropical Pacific climates where they spend the fall, winter and early spring. They usually leave Hawai'i for their trip back to the Arctic in late April or the very early part of May each year.

The remaining 26 species detected are regularly encountered alien species, common in the low to mid-elevation areas the Island of Kaua'i.

Other Species of Interest Not Detected

Although not detected during this survey, it is probable that the Hawaiian endemic sub-species of the Short-eared Owl (*Pueo* or *Asio flammeus sandwichensis*) use resources in the general project area. They are regularly seen foraging over open fields in the low- to mid-elevation areas on the Island.

Two other species not detected during this survey, Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened endemic sub-species of the Newell's Shearwater (*Puffinus auricularis newelli*) have been recorded over-flying the project site between April and the end of November each year. The petrel is listed as endangered, and the shearwater as threatened under both Federal and State of Hawai'i endangered species statutes.

3.6.1.2 Probable Impacts and Mitigation Measures

The findings of the avian survey were consistent with the findings of at least five other avian surveys conducted on lands immediately adjacent to portions of the proposed wastewater collection system in the recent past, as well the results of several other avian surveys conducted in the Kōloa-Po'ipū area in the recent past. Of the 29 species detected during the survey, 26 species were regularly encountered alien species, common in the low to mid-elevation areas the

Island of Kaua'i. The Regional WRF project should not have a significant impact on these alien avian species which occur within the project area.

The remaining three notable species detected in the area were the endangered Hawaiian Goose (Nēnē), and the indigenous White-tailed Tropicbird and Pacific Golden-Plover. The Regional WRF project should not have a significant impact on these three avian species. The sewer collection system would consist of underground sewer lines generally located along roadways that would not affect these avian species. The pump stations planned should not affect these avian species since the majority of the pump station equipment would be underground. Only some equipment would be located above ground, and these pump stations would not be sited within or next to areas of importance that are used by these species.

A few Hawaiian Goose (Nēnē), were seen on the ground several hundred yards south of the Kōloa Mill. Nenes have been known to nest close to the Waita Reservoir which is a considerable distance away from the proposed treatment facility at the Kōloa Mill. Nene nest from about October through the end of March, and those that are not on nests by January will not nest that season. Thus, the treatment facility should not impact those nesting sites. Several Nene were observed flying in the area of the mill site likely attracted to the corn fields located south of the Kōloa Mill. However, the treatment facility would not have resources that would attract Nene to this site for foraging or nesting activities.

The infiltration pond associated with the proposed treatment facility would be a basin used for the disposal of excess R-1 water treated from the facility or water not conforming to the R-1 quality requirements. As a result, this pond could occasionally be visited by Nene present in the area because such ponds are essentially creating habitat that may be used by these species. This is a common situation which occurs for other uses such as golf courses which have water features or ponds that creates habitat which can attract birds such as the Nene. The project's infiltration pond is not expected to negatively impact Nene.

The White-tailed Tropicbirds should not be affected by the treatment facility because they come to land only to breed, nest, and raise their young which usually occurs on rocky inaccessible cliffs. Therefore, such breeding and nesting would not occur within the treatment facility site or infiltration basin and because this would also make them susceptible to predators in the area.

Pacific Golden-Plover seen along roadways and in the more open areas is a migratory shorebird species that nests in the High Arctic and spend the fall, winter and early spring in warmer tropical climates. The treatment facility and infiltration basin would similarly not affect their breeding and nesting activities which occur in the High Arctic.

Effects on Other Species Not Detected

Although not detected during the survey, the Pueo owl probably uses resources for foraging in the open fields in the low-to-mid elevation areas. Similarly, the Hawaiian Petrel and the Newell's Shearwater have been recorded over-flying the treatment facility project site. The Save Our Shearwaters Program has recovered both species from the general project area on an annual basis over the past three.

The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters 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 of these 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.

The two closest historically known Newell's Shearwater colonies to any portion of the project area are, or were, located at Kāluahonu and above Kalāheo. The Kāluahonu colony is located approximately 2.2 miles northeast of the treatment facility site at the Kōloa Mill, and the Kalāheo colony is located more than 5.3 miles northwest of this mill site. It is currently thought that the Kāluahonu colony is no longer extant as no birds have been recorded there in over six years. It is unclear as to whether the Kalāheo colony is still extant. The only presently known Hawaiian Petrel colonies are located in remote valleys, inland from the north, and northeast shores of the Island of Kaua'i.

Construction of the project is not anticipated to impact Hawaiian Petrels and Newell's Shearwaters because such activities would be conducted during the day. Thus, construction activities would not occur at night or involve the use of exterior lightning that may affect flying seabirds.

The wastewater pump stations would not have any lighting, and the sewer collection lines would be underground and not impact these seabirds. The operation of the proposed treatment facility should have minimal impact on the Hawaiian Petrels and Newell's Shearwaters because the operation of the facility should not have activities occurring at night. No street lighting would be associated with this facility. Any outside lighting incorporated into the design of building structures at the treatment facility would be "cut-off" or similar style lights that would prevent lights from shining upward. These lights will thus be shielded to reduce the potential for interactions of nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures.

Mitigative Measures

To further minimize effects on the Nene which are present in the project area, the following mitigative measures are proposed for the wastewater treatment facility site:

1. If construction of various phases of this treatment facility occurs during the Nene nesting period from about October through the end of March, a Nene nest survey will be conducted to identify if there are any nests that may be affected by construction activities.
2. If Nene nests are present in the construction area, such construction activities would need to cease until the end of the nesting season.
3. An Awareness Training Program would be implemented for the construction workers to make them knowledgeable about procedures and practices that should be followed concerning Nene that may be present.
4. An Awareness Training Program would be implemented for the operational staff at the treatment facility to make them knowledgeable about procedures and practices that should be followed concerning Nene that may be present.

The following minimization measures during the course of construction activities for the project are also proposed for implementation to ensure that such activities have a minimal impact on either of the listed seabird species.

1. All construction personnel will be required to attend a seabird awareness program prior to the initiation of construction activity.
2. A pet carrier will be maintained on site at all times, and will be used to temporarily hold any downed seabird recovered in the general project area.
3. If a downed seabird is found within the general project area it will be retrieved and placed in the pet carrier and maintained in a shady location until DOFAW or SOS program personnel retrieve the bird.
4. DOFAW and/or the SOS program will be contacted immediately upon recovery of any downed bird.
5. The USFWS shall be notified of any downed seabird within 24-hours of the occurrence.

3.6.2. Mammalian Resources

Mammalian Survey Results

A total of eight (8) mammalian species were detected during the course of the surveys. Table 3-2 includes a listing of mammalian species identified. All but one of these species, the pig (*Sus s. scrofa*), was seen at one or more locations within the study corridors. Additionally, scat, tracks, and sign for all but one species, the domestic goat (*Capra h. hirca*), were encountered at several locations within the study corridors. All eight mammalian species detected during the course of this survey are considered to be alien species in the Hawaiian Islands. The endangered Hawaiian hoary bat was not seen during the course of this survey.

The findings of the mammalian survey are consistent with the findings of at least five other surveys conducted on lands immediately adjacent to portions of the proposed wastewater collection system in the recent past, as well as with the results of several other surveys conducted in the Kōloa-Po'ipū area in the recent past.

Table 3-2. Mammalian Species Detected			
Common Name	Scientific Name	A/V	S/T
CARNIVORA- Flesh -Eaters			
Canidae - Wolves, Jackals & Allies			
Domestic dog	<i>Canis f. familiaris</i>	X	X
Felidae- Cats			
House cat	<i>Felis catus</i>	X	X
PERISSODACTYLA - Odd-Toed Ungulates			
Equidae - Horses, Asses & Zebras			
Domestic horse	<i>Equus c. caballus</i>	X	X
Donkey	<i>Equus a. asinus</i>	X	
Mule	<i>Equus asinus x Equus caballus</i>	X	
ATRIODACTYLA - Even-Toed Ungulates			
Suicidae - Old World Swine			
Pig	<i>Sus s. scrofa</i>		X
Bovidae- Hollow-horned Ruminants			
Domestic cattle	<i>Bos Taurus</i>	X	X
Domestic goat	<i>Capra h. hircus</i>	X	

Key to Table

- A/V** Audio or Visual – detection
- S/T** Scat, Track or Sign – detection
- X** Detection

Although no Hawaiian hoary bats were detected during the course of this survey, bats have been recorded foraging for insects within the general project area in the recent past. Hawaiian hoary bats are widely distributed in the lowland areas on the Island of Kaua'i, and have been documented in and around almost all areas that still have some dense vegetation.

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

Probable Impacts and Mitigation Measures

Construction of the Regional WRF project and collection system improvements along with the operation of the treatment facility are not expected to result in a deleterious or significant impacts to native mammalian resources present within the general project area. The majority of mammals detected or likely present in the area were introduced species such as rodents, feral cats, dogs, pigs, etc. which are generally detrimental to the remaining native ecosystems.

Construction of the project is not expected to have a significant impact on bats that may be foraging for insects in the area. The present habitat at the Kōloa Mill site for the proposed treatment facility is not of the type or general vegetation makeup that one would ordinarily expect to find bats foraging in. Similarly, the sewer line corridors occur predominantly within or along existing roadways or cane haul roads which would not usually support foraging areas for bats. Once constructed, these sewer lines along with wastewater pump stations would not impact bats since the improvements would predominately be located underground. Similarly, the treatment facility should not impact bats which may forage in the surrounding areas.

3.6.3. Invertebrate Resources

Invertebrate Survey Results

Two subterranean invertebrate species present within the greater Kōloa-Po'ipū-Kukui'ula area are listed as endangered under both the Federal and State of Hawai'i endangered species statutes. These are the Kaua'i cave wolf spider (*Adelocosa anops*) and the Kaua'i cave amphipod (*Spelaeorchestia kōloana*). The USFWS has designated 14 Critical Habitat units for these two species in the greater Kōloa-Po'ipū-Kukui'ula area. Three of these units (Nos. 4, 10 and 12) are located relatively close to portions of the project. Only one unit (No. 10) is immediately adjacent to any part of the proposed project. Figure 3-5 graphically shows the locations of these designated Critical Habitat units.

No subterranean invertebrate survey was conducted for the Project because the biologists and archaeologists that surveyed the project area were unable to locate any cave or lava tube openings within the various project sewer line corridors investigated or at the treatment facility site.

Probable Impacts and Mitigation Measures

The only probable impact to subterranean invertebrate species would occur during construction activities. The operation of the treatment facility and collection system would not affect subterranean invertebrate species. Therefore, only short-term construction activities for the proposed improvements may impact such species.

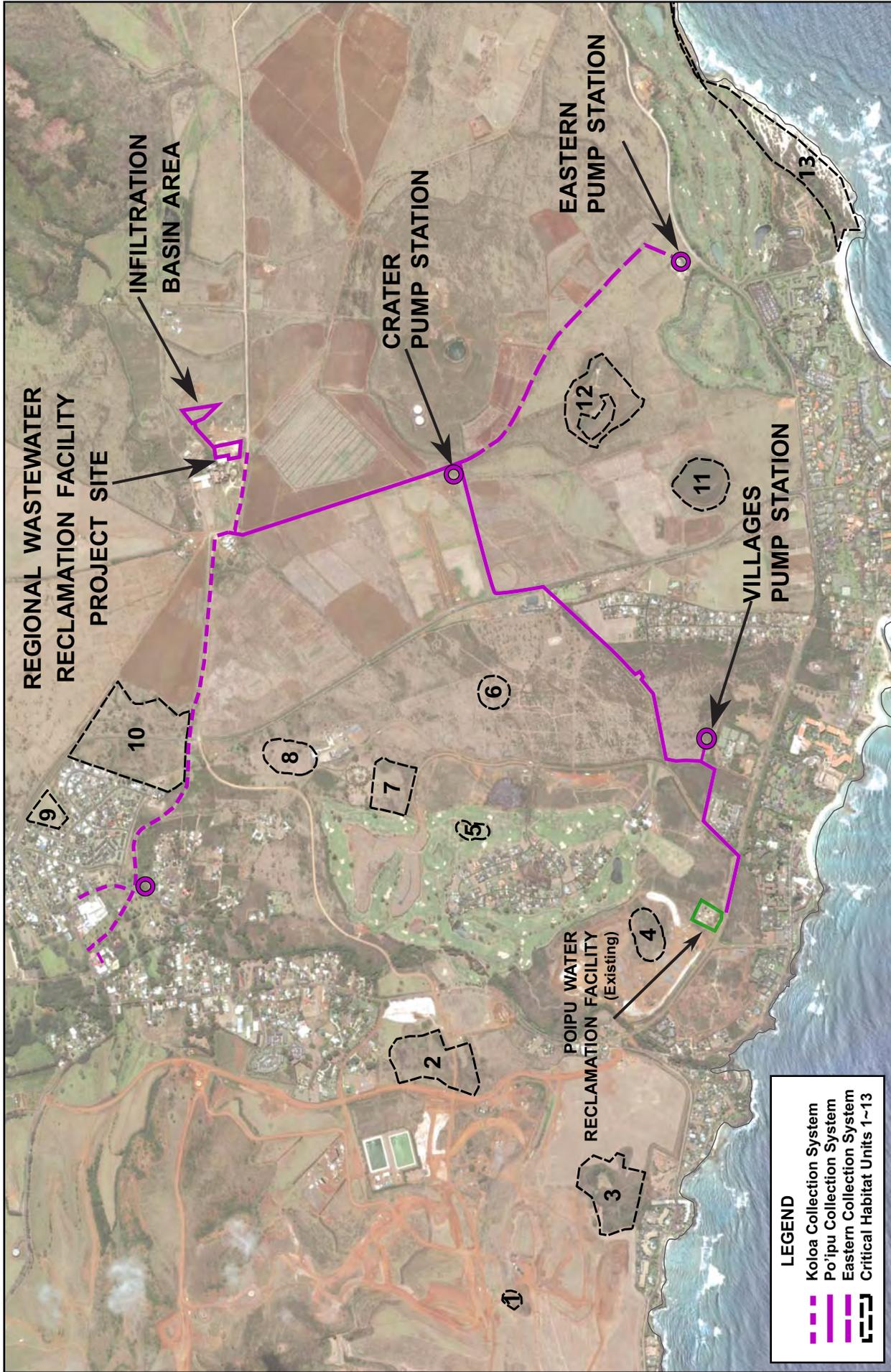


FIGURE 3-5
DESIGNATED CRITICAL HABITAT UNITS IN PROJECT VICINITY
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

Source:
 Digital Globe (Aerial Map - May 2007)
 Aqua Engineers, Inc. (Regional Facility System)

North

If a lava tube or cave is broken into during construction activities, a survey of that void will need to be conducted immediately. A set of lava tube/cave break-in guidelines and procedures will be prepared prior to the initiation of construction activities to ensure that impacts to any archaeological, cultural or natural resource components potentially present is minimized to the maximum extent practicable.

3.6.4. Aquatic Resources

As previously discussed, the streams in the Waikomo Watershed that includes Waihohonu Stream, Ōma'ō Stream, and Waikomo Stream appear to be somewhat degraded. Years of modifications for agricultural uses have impacted stream water quality, flow characteristics, and the biotic composition. Remnants of the Kōloa irrigation system, including mill settling basins, siphons, ditches, and flumes also remain in the landscape of the project area.

No aquatic habitats were observed to be present in the project area since all “water features” along proposed routes were normally dry irrigation ditches. Standing water in a portion of a pond formerly used for sugar operations situated east of the Kōloa Mill was a temporary impoundment. This pond provides, at most, limited breeding habitat for aquatic insects such as mosquitoes. No state or federally listed endangered or threatened or native migratory (amphidromous) aquatic species were observed in the Project area.

Probable Impacts and Mitigation Measures

No long-term impacts on aquatic resources are expected associated with the operation of the Regional WRF project. Short-term construction related activities may have a minor temporary impact on aquatic resources outside of the project area.

To minimize temporary effects from construction activities, a Best Management Practices (BMP) plan would be developed and implemented to minimize environmental impacts to water quality and aquatic biota downslope from the project area. Project design plans will be prepared during the design phase which would be submitted to pertinent agencies for their ministerial review and approval. Grading activities will comply with the State DOH's Title 11, Chapters 54 and 55, HAR regarding water quality standards and water pollution control, respectively, and the County's Grading Ordinance. A National Pollutant Discharge Elimination System (NPDES) Permit for Construction Storm Water Activities will also be obtained from the State DOH prior to the start of construction of the proposed improvements.

3.7. ARCHAEOLOGICAL AND HISTORIC RESOURCES

An archeological inventory survey was conducted for the project by Cultural Surveys Hawai'i, Inc. (CSH). This inventory survey was conducted in consultation with the State Historic Preservation Division (SHPD) in compliance with Chapter 6E-42, HRS, Chapter 13-13-284, HAR, and State requirements for archeological field surveys (Chapter 13-376-4, HAR). A copy of this report is included in Appendix D of this document. The survey consisted of the following:

1. A ground survey of the entire project area for the purpose of historic property identification and documentation. All historic properties were located, described, and mapped with evaluation of function, interrelationships, and significance.
2. Research on historic and archaeological background, including search of historic maps, written records, and Land Commission Award documents.
3. Appropriate consultation with knowledgeable members of the community, requesting information on historic properties in the project area.

Based on available information, the Regional WRF Project should not impose adverse visual, auditory or other environmental impact to any known historic properties, including standing architecture, located outside the project area. Accordingly, the project lacks potential to affect historic properties outside the project area. As a result the project's Area of Potential Effect (APE) is the same as the project area. The APE survey area investigated therefore included the entire area proposed for the wastewater treatment facility, pump stations, and a 10-foot-wide corridor along the planned sewer collection system.

Architectural Inventory Survey

An architectural inventory survey was conducted for the Kōloa Mill because portions of this mill facility are over 50 years old and may contain structures of historic importance. It should be noted that this Kōloa Mill site is an entirely separate and different sugar mill from the other historic "Old Sugar Mill of Kōloa" situated at the junction of Maluhia Road with Kōloa Road within the town of Kōloa and listed on the National Register of Historic Places.

This architectural inventory survey was conducted by Mason Architects, Inc., and a copy of their report is included in Appendix E of this document. The survey was undertaken to gather sufficient information to assess the historic significance of the complex of buildings which constitute the former Kōloa Sugar Company mill. The historic resources inventory forms were completed following a visit to the site in May 2009. Basic historic research concerning the site was undertaken which included conversations with former McBryde Sugar Company employees.

3.7.1. Archaeological Inventory Survey Results

3.7.1.1 Previous Archeological Research and Findings

Background research has indicated that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. Waters diverted from Waikomo Stream were utilized for the cultivation of taro and native sugar, and for fish aquaculture. Previous archaeological studies have documented extensive pre-contact indigenous Hawaiian habitation and agriculture within and in the immediate vicinity of the southwestern portion of the project area, where the current investigation documented the presence of two historic properties of pre-contact origin. Figure 3-6 graphically shows the areas covered by previous archaeological studies.

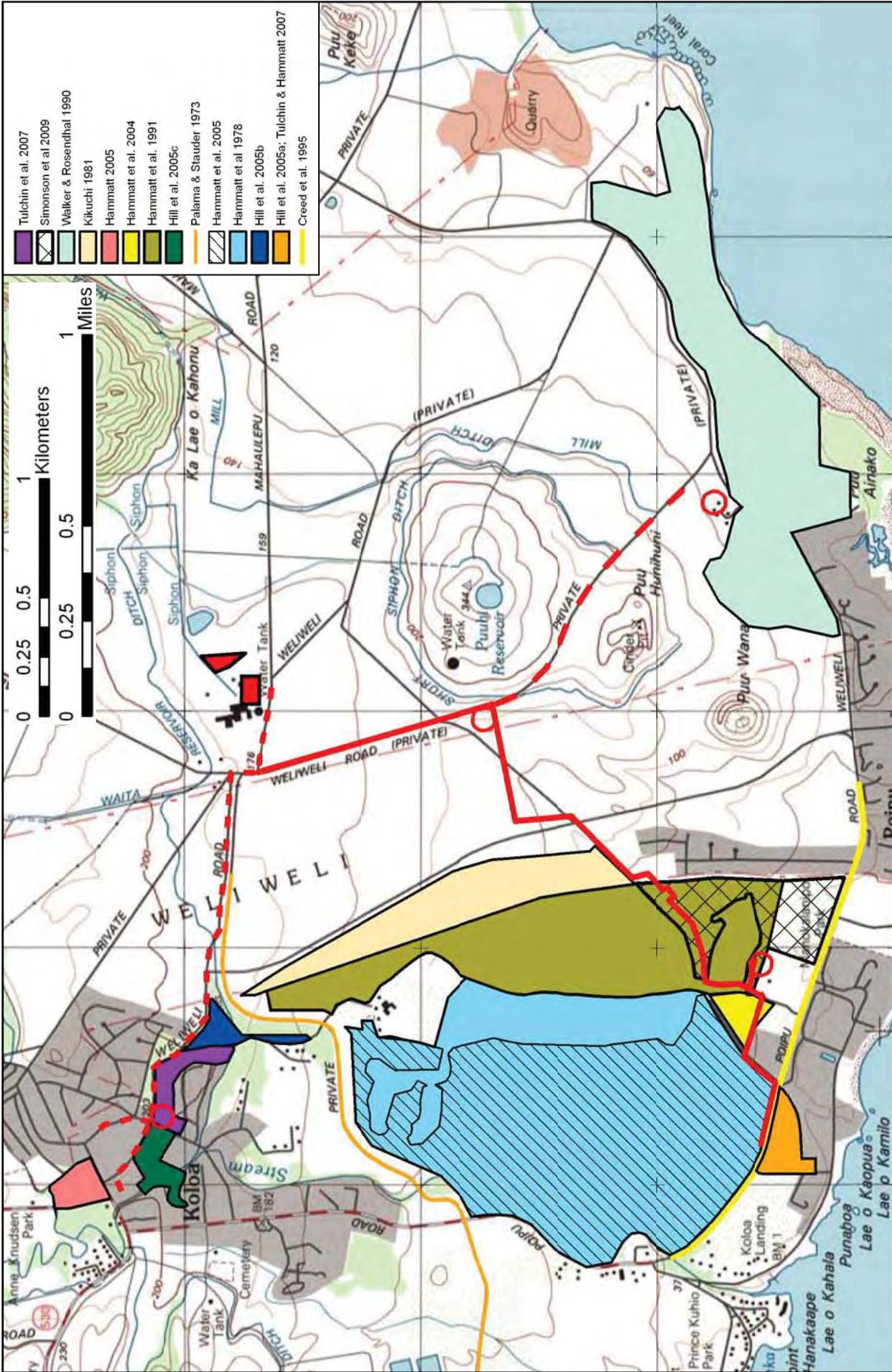


FIGURE 3-6
PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS IN PROJECT VICINITY
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC

Source:
 Archaeological Inventory Survey
 Cultural Surveys Hawaii, Inc.



During the post-contact period, a majority of the project area was utilized for the cultivation of sugarcane. Historic maps indicate extensive sugarcane fields and sugar transport infrastructure (railroad tracks and berms), as well as sugarcane processing facilities (sugar mill) within and in the immediate vicinity of the project area. Previous archaeological research has identified remnants of sugarcane infrastructure, in the form of abandoned railroad berms and irrigation flumes in the vicinity of the western portion of project area.

Based on background research, it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area, an area proposed for the development of the Po'ipū Collection System. This area has been determined to be within what is known as the Kōloa Field System, an extensive network of irrigated agricultural complexes and associated habitations located within central and coastal Kōloa. Evidence of pre-contact land use could be in the form subsurface cultural deposits containing human burials, midden deposits, and artifacts (i.e. stone tools).

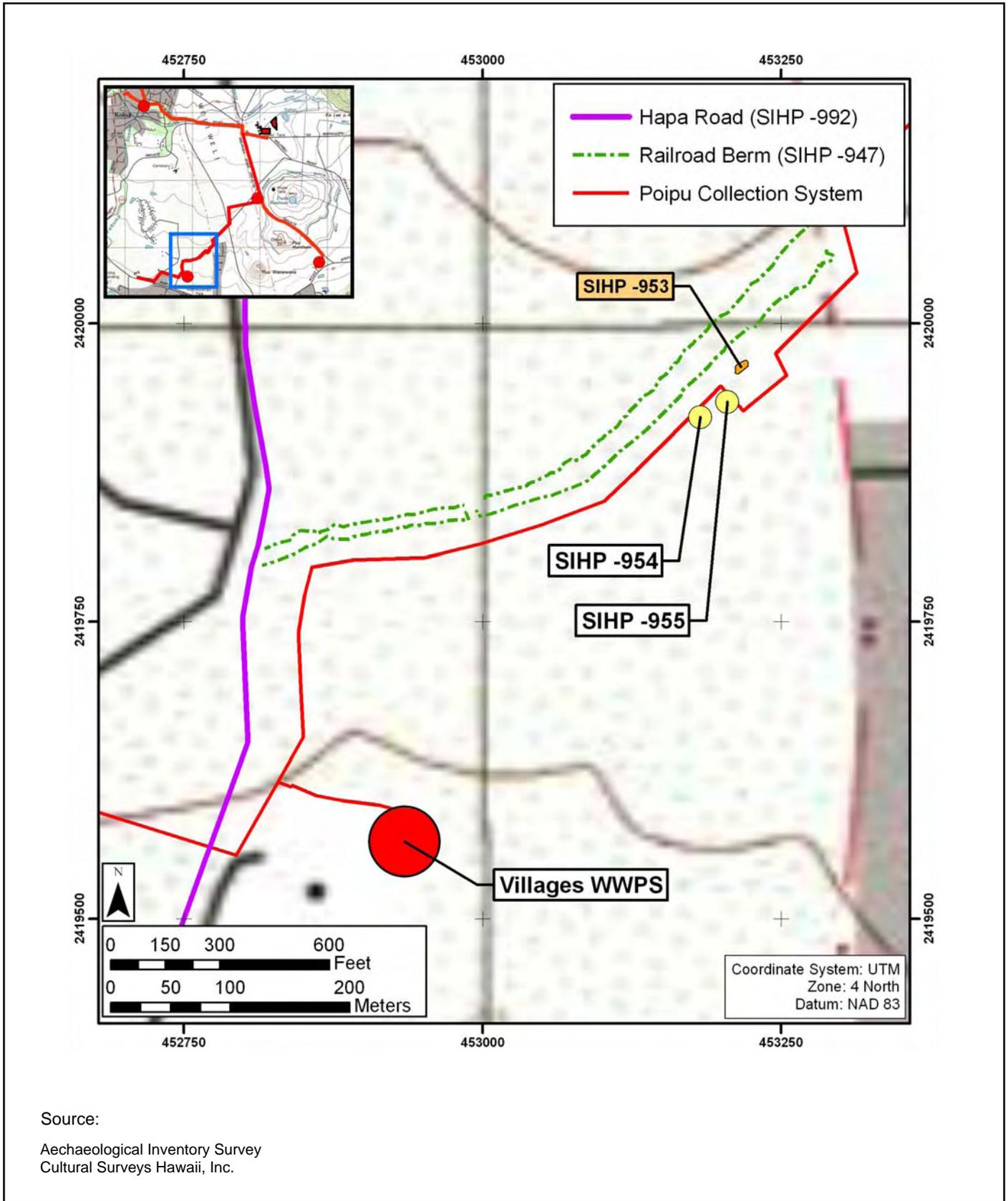
3.7.1.2 Results of Archaeological Fieldwork

Pedestrian inspection of the project area relocated three previously identified historic properties which have State Inventory of Historic Properties (SIHP) numbers. All three historic properties were located in the area proposed for the Po'ipū Collection System component of this project. Figure 3-7 graphically shows these sites in relation to the sewer collection system corridor. These sites are identified below.

1. SIHP #50-30-10-954. A pre-contact habitation enclosure, terrace, and platform.
2. SIHP #50-30-10-955. A pre-contact habitation platform.
3. SIHP #50-30-10-992. A post-contact dirt road with parallel stacked stone boundary walls.

All three historic properties relocated were previously identified by CSH in 1991 during an archaeological inventory survey for the proposed Po'ipulani Golf Course and residential development. Additionally, two of the sites (SIHP -954 and SIHP -955) were subjected to data recovery in the form of subsurface testing this year (2009). Test excavations revealed that both historic properties were utilized sporadically as temporary habitations. This provided shelter to pre-contact and early post contact indigenous Hawaiians while they tended to nearby agricultural fields and associated infrastructure, all of which was part of an elaborate agricultural complex known as the Kōloa Field System.

There are also two previously identified historic properties located in the immediate vicinity of the Po'ipū Collection System corridor. These historic properties were originally identified by CSH in 1991, and were recommended for preservation. Both historic properties are located about 80 feet mauka or inland (north) of the sewer collection system route. Figure 3-7 graphically shows the location of these two historic sites. These sites are identified as:



Source:
 Archaeological Inventory Survey
 Cultural Surveys Hawaii, Inc.

**FIGURE 3-7
 PREVIOUSLY IDENTIFIED HISTORIC SITES
 WITHIN PROJECT AREA**



1. SIHP #50-30-10-947. A stacked basalt railroad berm associated with Kōloa Plantation.
2. SIHP #50-30-10-953. A pre-contact probable burial platform constructed of stacked basalt boulders.

A majority of the project area is situated within asphalt paved, dirt, or old cane haul roads that would have involved grading, cutting, and/or filling activities as part of their construction. Other portions of the project area are situated within fallow agricultural fields that were being cultivated for decades prior to abandonment. The presence of only three historic properties within the entire project area can be attributed to these observed land modifications. The survey confirmed these extensive post-contact and modern disturbances throughout the project area associated with historic sugarcane cultivation as well as modern agriculture and urban development.

3.7.1.3 Descriptions of Historic Properties

Descriptions of the previously identified historic properties present within the project area are discussed. Table 3-3 provides a summary of their characteristics.

Table 3-3. Summary of Historic Properties Identified Within Project Area						
SIHP # (50-30-10)	Site Type	Features	Age	Function	Significance Criteria	Mitigation Recommendations
-954	Enclosure, terrace, and platform	2	Pre-contact	Habitation	D	No Further Work
-955	Platform	1	Pre-contact	Habitation	D	No Further Work
-992	Dirt road with parallel stacked stone boundary walls	1	Post-contact	Transportation	C & D	Preservation

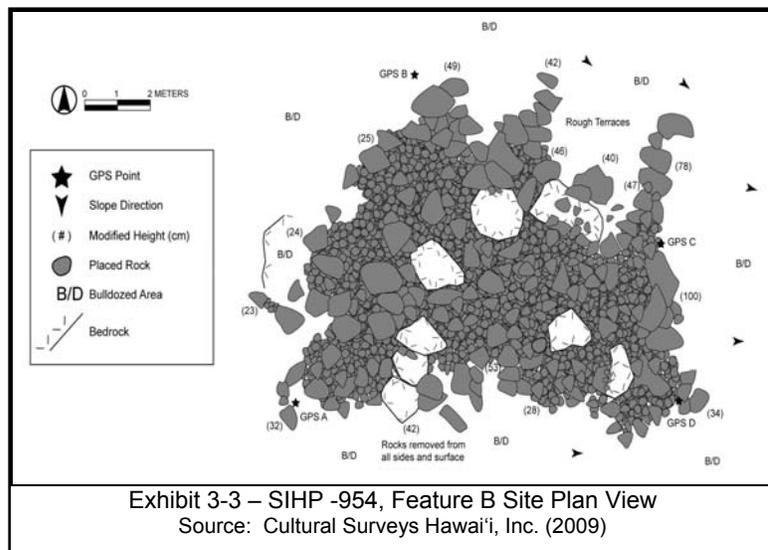
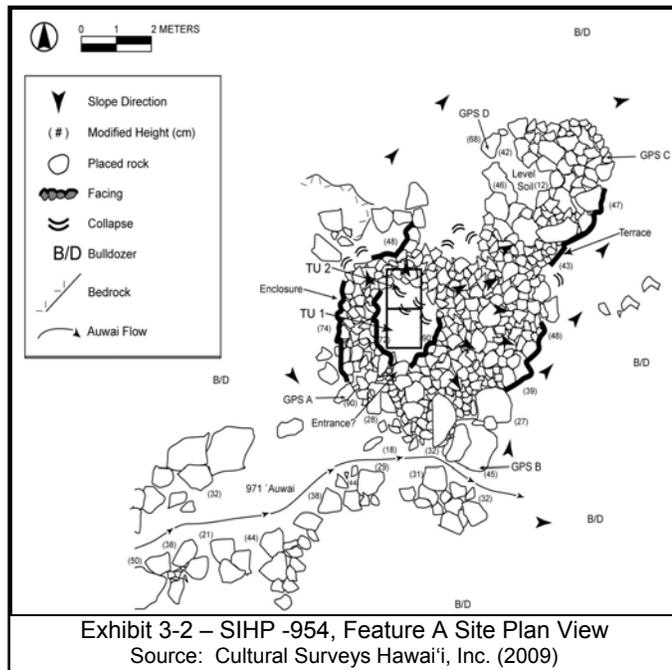
SIHP Site #50-30-10-954

In 2007, this site was relocated by CSH and identified with GPS, remapped, and the description was modified. CSH also conducted data recovery excavations at SIHP -954 in 2007. Two test units (TU 1 & 2) were placed within SIHP -954A. Test excavations revealed a buried cultural layer containing marine shell and faunal bone midden, basalt flakes, fire-cracked rock, and charcoal. A summary of this site is shown below, and the description of its features provided.

FORMAL TYPE:	Enclosure, terrace, and platform
FUNCTION:	Habitation
# OF FEATURES:	2
AGE:	Pre-contact
DIMENSION:	10 m N/S by 6.3 m E/W
TAX MAP KEY:	[4] 2-08-014: 037
LAND JURISDICTION:	Privately-owned, E.A. Knudsen Trust

Feature A of Site 954 is a pre-contact, circular habitation enclosure with a small attached agricultural terrace on the NE side (see Exhibit 3-2). The entire site measures 10 meters by 6.3 meters with a maximum height of 0.74 meters. It is constructed of stacked basalt boulders in 2 to 4 courses, with cobble fill in some areas. Vertical facing is present at the western exterior of the enclosure, the W and E sides of the interior, and along portions of the terrace. The interior of the enclosure is 2.0 meters in diameter, and there is an entrance on the south side. Much of the exterior is filled with rubble from the collapse of the wall on the N side. The terrace measures 5 meters by 3 meters. Site 971, an 'auwai, passes adjacent to the S of the feature. Bulldozed areas surround this site, which is located on gently sloping terrain with bedrock outcrops. Vegetation includes koa haole, cacti and unidentified grasses. The condition of the feature is good and the excavation potential is good due to it likely being a habitation site.

Feature B of Site 954 is likely a pre-contact habitation platform measuring 14 meters by 10 meters with a maximum height of 1.0 meter (see Exhibit 3-3). Construction incorporates a bedrock outcrop and many in situ bedrock boulders. The surface is roughly paved with boulders and cobbles. On the NE side, two (2) rough boulder/cobble terraces extend outward



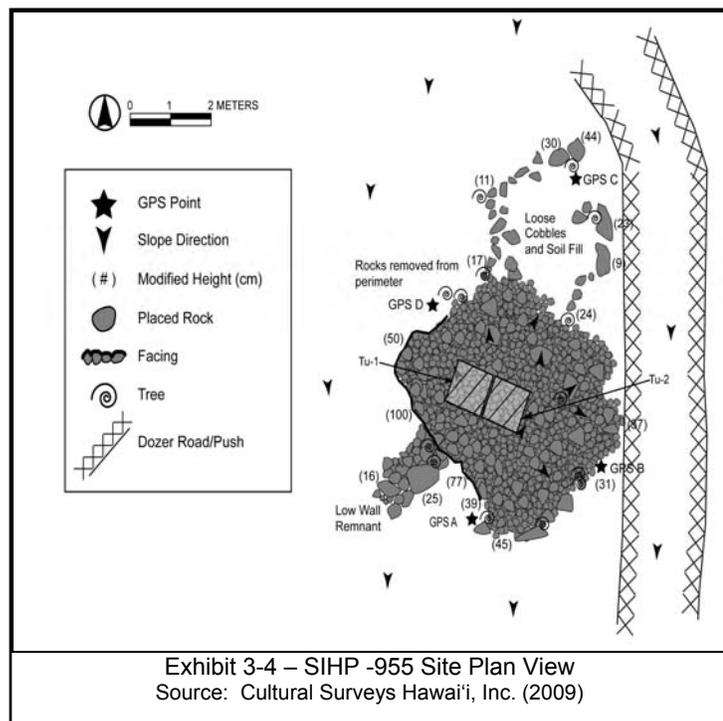
toward the NE. The two (2) terraces are 2.0 and 3.0 meters long, and are bulldozed at their NE ends. No cultural material was observed on the surface. No facing exists, likely due to rock removal from the structure. Vegetation includes koa haole, cacti, and unidentified grasses. This is a newly restored feature. The condition is poor and the excavation potential is fair due to much of the central portion of the feature being intact.

SIHP Site #50-30-10-955

In 2007, this site -955 was relocated by CSH and identified with GPS, remapped, and the description was modified. CSH also conducted data recovery excavations at SIHP -955 in 2007. Two test units (TU 1 & 2) were placed within SIHP -955A. Test excavations revealed a buried cultural layer containing a hearth, marine shell and faunal bone midden, basalt flakes, fire-cracked rock, and charcoal. A summary of this site is provided, and the description of its features provided.

FORMAL TYPE:	Platform
FUNCTION:	Habitation
# OF FEATURES:	1
AGE:	Pre-contact
DIMENSION:	8.4 m by 6.3 m
TAX MAP KEY:	[4] 2-08-014: 037
LAND JURISDICTION:	Privately-owned, E.A. Knudsen Trust

Site 955 is a 6.1 meter (N/S) by 5.7 meter platform (see Exhibit 3-4). The platform is constructed of basalt boulders and cobbles of various sizes stacked two (2) to six (6) courses high with a maximum height of 1.0 meter. The facing along the west end of the platform is very distinct and in excellent condition compared to the rest of the sides. At the north, northeast end of the platform, intensive rock removal took place. All that remains is an outline of small basalt boulders. There is a 1.8 meter (NE/SW) by 1.1 meter (NW/SE) low wall constructed of basalt boulders and cobbles stacked one (1) to two (2) courses high with a maximum height of 0.25



meters. The site is situated on a gently sloping area with a dozed road just east of it. Due to the construction and height of the wall as well as the size, it is possible that this site is a burial. Vegetation consisted of cacti and koa haole.

The test excavation findings under the data recovery effort ruled out the initial determination of the site having a possible burial function. Based upon the presence of the midden and the hearth, the function of SIHP -955 was determined to be habitation.

SIHP Site #50-30-10-992

SIHP #50-30-10-992 was described in a 2004 archaeological inventory survey conducted for the Eric A. Knudsen Trust Lands. A summary of this site is provided, and the description of it provided.

FORMAL TYPE:	Dirt road with stacked stone boundary walls
FUNCTION:	Transportation
# OF FEATURES:	1
AGE:	Post-contact
DIMENSION:	750+ m long by 7.3 m wide
TAX MAP KEY:	[4] 2-08-014: 021 and 030
LAND JURISDICTION:	Privately-owned, E.A. Knudsen Trust

Site 50-3-10-992 is a stacked boulder wall on both sides of Hapa Road, which runs between Po'ipū Road and Kōloa Town. The road's west wall adjoins the east side of the project area. In some areas the wall has been reduced to its foundation by rock thieving. Along its length, the original alignment of the wall is still traceable even though the bulk of the rocks are gone. Much of the wall is core-filled construction. SIHP - 992 roughly runs in a north-south direction with the current project area bisecting it approximately



Exhibit 3-5 – Photograph of SIHP -992 (Hapa Road)
 Near Sewer Line Underground Crossing
 Source: Cultural Surveys Hawai'i, Inc. (2009)

164 m mauka (inland) of Po'ipū Road. The portion of SIHP -992 observed within the project area consisted of two 3 m long stacked basalt boulder wall remnants bordering a dirt roadway. The boundary wall segments measured approximately 10 to 50 cm high and 0.8 to 1.0 m wide, and were constructed of basalt boulders and cobbles stacked 2-3 courses high (see Exhibit 3-5). The two wall remnants border a dirt roadway measuring approximately 6 m wide.

3.7.1.4 Probable Impacts and Mitigation Measures

The archaeological inventory survey investigation confirmed the extensive post-contact and modern disturbances throughout the project area. A majority of the project area is situated within either asphalt paved or dirt roads that would have involved grading, cutting, and/or filling during road construction. Other smaller portions of the project area are situated within fallow fields that were being cultivated for decades prior to abandonment. The presence of only three historic properties within the entire project area can be attributed to these observed land modifications.

Interpretation of Results

The findings of this archaeological inventory survey were largely in keeping with expectations. Background research indicated that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. Previous archaeological studies documented extensive pre-contact indigenous Hawaiian habitation and agriculture within and in the immediate vicinity of the southwestern portion of the project area.

During the post-contact period, a majority of the project area was utilized for the cultivation of sugarcane. Historic maps indicate extensive sugarcane fields and sugar transport infrastructure (railroad tracks and berms), as well as sugarcane processing facilities (sugar mill) within and in the immediate vicinity of the project area. Previous archaeological research has similarly identified remnants of these sugarcane infrastructures.

Based on the background research, it was likely that subsurface historic properties associated with pre-contact land use may be present within the southwestern portion of the project area. This is an area proposed for the development of the Po'ipū Collection System portion of the project. This area is within the Kōloa Field System which was an extensive network of irrigated agricultural complexes and associated habitations located within central and coastal Kōloa. Evidence of pre-contact land use could be in the form subsurface cultural deposits containing human burials, midden deposits, and artifacts (i.e. stone tools).

The survey of the project area identified only three historic properties within the southwestern portion of the project area planned for the development of the Po'ipū Collection System component of the project. All three historic properties (SIHP -954, -955, & -992) were previously identified. Additionally, SIHP -954 and SIHP -955 were subjected to data recovery in the form of subsurface testing in 2009. These test excavations revealed that both historic properties were utilized sporadically as temporary habitations, providing shelter to pre-contact and early post contact indigenous Hawaiians while they tended to nearby agricultural fields and associated infrastructure.

Significance and Project Effect Recommendation

The inventory survey investigation documented three previously identified historic properties within the project area. The significance assessment for these three historic properties was previously assessed by CSH in 1991 as part of a prior archaeological inventory survey of the project area. The significance for these sites have not changed based upon the current inventory survey, and the evaluation criteria used by the Hawai'i State Register of Historic Places (13-284-6, HAR) consists of the following.

- A Historic property reflects major trends or events in the history of the state or nation.
- B Historic property is associated with the lives of persons significant in our past.
- C Historic property is an excellent example of a site type.
- D Historic property has yielded or may be likely to yield information important in prehistory or history.
- E Historic property has cultural significance to an ethnic group, including, but not limited to, religious structures, burials, and traditional cultural properties.

SIHP #50-30-10-954 is a pre-contact habitation enclosure, terrace, and platform, and has integrity of location and materials, and was recommended eligible to the Hawai'i Register under criteria D. SIHP #50-30-10-955, a pre-contact habitation platform, has integrity of location and materials, and was recommended eligible to the Hawai'i Register under criteria D. SIHP #50-30-10-992, a post-contact dirt road with parallel stacked stone boundary walls, has integrity of location and materials, and was recommended eligible to the Hawai'i Register under criteria C and D.

No further historic preservation work is recommended for SIHP #50-30-10-954 and SIHP #50-30-10-955. Sufficient information regarding these sites has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities. Additionally, both historic properties were previously identified and documented, and were subjected to data recovery in the form of subsurface testing this year.

CSH's project specific effect recommendation is "effect, with proposed mitigation commitments." The recommended mitigation measures will reduce the project's effect on previously identified surface historic properties as well as any yet to be identified subsurface historic properties that may be located within the project area, and be pro-active in addressing possible community concerns.

Mitigative Measures

To reduce the proposed project's potential adverse effect on significant historic properties, the following mitigation measures are recommended. These measures primarily concern the Po'ipū Collection System portion of the project. The mitigation measures should be completed prior to any land disturbing activities within the project area associated with this or other phased development of the project.

It is recommended that a cultural resource preservation plan in accordance with Title 13-277-3, HAR be prepared for the proposed Regional WRF project to address buffer zones and protective measures for SIHP #50-30-10-992, a post-contact road (Hapa Road) located within the Po'ipū Collection System project corridor. Additionally, the cultural resource preservation plan should address SIHP #50-30-10-947 (post-contact railroad berm) and SIHP #50-30-10-953 (pre-contact probable burial platform) also located in the vicinity of this sewer line corridor. These sites were previously recommended for preservation. This preservation plan should detail the short- and long-term preservation measures that will safeguard the historic properties during project construction and subsequent operations within the project area.

It is likely that subsurface historic properties may be present within this southwestern portion of the project area along the Po'ipū Collection System corridor. In order to mitigate the potential damage to potential historic properties within the makai (seaward) portion of the project corridor, it is recommended that project construction proceed under an archaeological monitoring program. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered. The monitoring specifics will be addressed in an archaeological monitoring plan prepared, reviewed, and approved by the SHPD.

In the event cultural artifacts, subsurface human remains or other indications of human activity older than 50 years are encountered during construction activities, all work will stop immediately and the State DLNR Historic Preservation Division (SHPD) will be notified. The treatment of any human remains encountered will be determined and conducted in accordance with the applicable requirements of Chapter 6E, HRS, and Chapter 13-300, HAR. During the Project's design phase, construction plans developed will also be coordinated with the SHPD for review and comment.

3.7.2. Historical Architectural Resources

3.7.2.1 Historic Context

Waihohonu Mill (Old Sugar Mill of Kōloa)

Ladd and Company, the predecessor to the Kōloa Sugar Company, was the first company to be somewhat successful in the production of sugar. This company obtained a 50-year lease and water rights for about 1,000 acres of land in Kōloa in 1835. The plantation provided worker housing, and addressed medical needs, thereby establishing the foundations of the plantation system which spread throughout the Islands and endured for over 100 years.

Initially, 25 acres of sugar cane were cultivated at Kōloa in a rudimentary mill located at Maulili. Ladd and Company later constructed a larger sugar mill in 1841 at Waihohonu on lands leased to the Kōloa Sugar Company. The stone stack of this mill still stands in the heart of Kōloa town at the intersection of Maluhia and Kōloa Roads. The Waihohonu Mill was updated

in 1853, and in 1869 became the first steam powered mill on Kaua'i. It fulfilled the sugar company's needs for the remainder of the nineteenth century and into the twentieth century. This mill's location was the third and final mill site used by the Kōloa Sugar Company. By 1912, it was apparent that the Waihohonu factory was outdated and required extensive repairs.

Kōloa Mill

In June 1912, the Kōloa Sugar Company decided to construct a new mill on lands owned by the company rather than expending moneys on repairing and upgrading a mill that sat on leased land. A site for the new factory was chosen in Paa, midway between Waita Reservoir and Puuhi Reservoir. Work was started in early 1913 on the foundations and various adjuncts to the factory, such as shops, warehouses, railroads and roads. Construction on the factory was completed in 1913.

The years immediately following construction of the new Kōloa Mill were the most profitable for Kōloa Sugar Company, in large part due to the high sugar prices engendered by World War I. Following World War I, the price of sugar dropped tremendously, but the introduction of tractors into the fields and other efficiencies resulted in greater sugar production. Throughout the 1930s and 1940s, Kōloa Sugar Company confronted economic difficulties, and by 1946 the company found itself over one million dollars in debt.

At this time Grove Farm was also discovering the economic disadvantages of a small operation. Grove Farm had no mill of its own, and thus acquired Kōloa Sugar Company in 1948 thereby doubling its acreage planted in cane and coming into possession of its own mill. Grove Farm substantially upgraded the Kōloa Mill, cleared the Kōloa fields of stones to allow mechanization of the harvests, and inaugurated the use of tracks, rather than the railway, to transport the cane to the mill and the sugar to the docks.

Sugar in Hawai'i continued to decline in the face of international competition. In 1974, Grove Farm decided to close as well, and leased its mill and surrounding lands to McBryde Sugar Company. McBryde Sugar Company shifted its milling operations to Kōloa, closed its Numila mill near Eleele, transferred its best equipment to Kōloa, and also upgraded and expanded the Kōloa Mill so that it could handle all of the company's harvest. The Kōloa Mill continued in operation for another 22 years, but Hurricane Iniki destroyed much of the company's fields in 1991. McBryde gradually phased out of sugar production and concluded its sugar operations in 1996 when it closed the mill.

3.7.2.2 Buildings and Structures Inventory

The site visit by Mason Architects, Inc. identified eight (8) buildings and five (5) structures associated with the former Kōloa Sugar Company's mill site (Kōloa Mill) that remain standing. These included the following:

Buildings:

1. Bagasse Storage Building
2. Sugar Mill
3. Parts Warehouse
4. Water Pump Sheds
5. Office Building
6. Electric Shop and Laboratory
7. Sugar Bins
8. Sugar Storage Building

Structures:

1. Water Tank
2. Molasses Tank
3. Day Tank
4. Foundations of Former Cleaning Plant
5. Stack

All eight (8) buildings and five (5) structures were photographed and historic resource forms were completed for each which are included in Appendix E. Of these buildings and structures, the sugar mill building, water pump sheds, sugar bins, sugar storage building, molasses and day storage tanks, and cleaning plant foundations are over 50 years old and appear to meet the criteria for listing in the Hawai'i and National Registers of Historic Places.

The bagasse storage building, water tank, stack, parts warehouse, office building, and electric shop are not 50 years old, and do not appear to meet the National Register's Criteria Consideration G for exceptional importance for properties less than 50 years old. Therefore, they are not considered to be historic properties.

3.7.2.3 Probable Impacts and Mitigation Measures

Of the mill's buildings and structures listed above, only the bagasse storage building and water tank would be directly included as part of the proposed wastewater treatment facility. Therefore, the project will have no direct effect upon historic properties because both the bagasse storage building and water tank structures were constructed by McBryde in the 1970s. Retaining and reusing the water tank and bagasse storage building, will allow the sugar mill complex to remain intact.

However, the reuse of these two components may have an indirect effect on the historic buildings and structures that comprise the sugar mill complex by introducing a new function as well as new visual and atmospheric elements to the complex, thereby reducing its integrity with regards to setting, feeling, and associations.

Mitigative Measures

To mitigate any indirect effects on the Kōloa Mill, additional digital photographs documenting the water tank and bagasse storage building should be taken and provided to the SHPD. A copy of the original drawings of the bagasse storage building's conveyor system, which are presently held by Grove Farm Plantation, should also be provided to the SHPD.

3.8. CULTURAL RESOURCES

A cultural impact assessment (CIA) study was conducted for the project by Cultural Surveys Hawai'i, Inc. (CSH), and the results of this survey is summarized in a report dated May 2009 and included in Appendix F of this document. The scope of work for this study included the following:

1. Examined historical documents, Land Commission Awards, and historic maps to identify traditional Hawaiian activities as may be indicated in the historic record.
2. Reviewed existing archaeological information pertaining to sites present on the property to reconstruct traditional land use activities, and identify and describe the cultural resources, practices and beliefs associated with the parcel.
3. Conducted oral interviews with persons knowledgeable about the historic and traditional practices in the project area and region.

3.8.1. Community Consultations

CSH made an effort to contact and consult with Hawaiian and kama'ina cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about cultural resources and practices specifically related to the project area in the context of Kōloa Ahupua'a. This effort was made through the use of letters, e-mails, telephone calls, and in-person interviews. A listing of all community consultations conducted is included in their study in Appendix F along with the input recorded from these consultations. A number of attempts (two to three) were made to contact individuals, organizations, and agencies relevant to the CIA.

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. The organizations consulted included the State Historic Preservation Division, the Office of Hawaiian Affairs (OHA), the Kaua'i-Ni'ihau Islands Burial Council (KNIBC), the Kaua'i Historic Preservation Review Commission (KHPRC), Malama Mahaulepu, the Kōloa Neighborhood Center, and community and cultural organizations in the Kōloa area.

These efforts lead to the identification of potentially knowledgeable informants. A total of 58 parties were actually contacted and 28 parties were willing to speak on traditional cultural practices in the vicinity of the project area were the primary sources of information. Extended formal interviews were held with 10 of these informants. Two community members referenced as Kōloa Resident #1 and #2 in the study chose not to be named. Therefore, they were not included in the community consultation table included in the report.

3.8.2. Background Research Results

From previous archaeological studies and historic accounts, it appears that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. As an extensive irrigated complex, the Kōloa Field System was used to divert the waters of the Waikomo Stream for taro, native sugar, and fish. In the early post-contact era (1795-1880), the Kōloa Field System continued in use for foreign trade and was probably further intensified. Sweet potatoes were a main crop for the whaling and merchant ships, and the purchase of pigs, salt, oranges and other items were noted in many ship journals.

Documents of the Great Mahele showed that by the mid-1800s there were still several traditional farmers within Kōloa who both lived and worked within the area. The individual claims for both lo'i (wetland) and kula (dryland) suggest that while traditional farming of taro for subsistence was still taking place, sugar cane production for sale to the nearby sugar mill within kula lands had begun to dominate the landscape. Of the LCAs within Kōloa, several claim a kula planted with cane or a cane field or sugar cane garden. Several also identify cane lands as boundaries for the LCAs. Within three years of sugar cultivation by Ladd and Company in 1835, residents in and surrounding Kōloa were quickly moving to adapt to the new economy based on the production of sugar cane. Eventually, most of inland Kōloa was planted with sugar cane, and only the rockiest areas, unsuitable for cultivation, survived the changes in the landscape brought about during the early 20th century.

The Kōloa Sugar Company had previously purchased the ahupua'a of Pā'ā southeast of Kōloa town. A new mill (Kōloa Mill) was built in 1912 about a mile away from the town, and finally closed in 1996. By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline. Although the town had established a Civic Center in 1977, the pace of tourism-driven development along the coastline drew construction and service jobs away from the town center.

Potential for Historic Properties

Based on background research, historic properties (i.e. archaeological sites) in the form of pre- and post-contact surface architecture could be encountered in the project area. Historic research indicated five LCAs in the vicinity of the project area, suggesting indigenous Hawaiian land use in the form of habitation and agriculture. Previous archaeological research documented evidence of both pre- and post contact land use in the area.

Evidence of indigenous Hawaiian land use could include both habitation (platforms, enclosures, and C-shapes) and agricultural (terraces, mounds, field walls, etc.) features. Evidence of post-contact land use is likely to be associated with historic sugarcane cultivation and could include irrigation infrastructure (ditches and flumes), sugar transport infrastructure (road causeways, railroad berms, etc.), clearing mounds, and boundary walls.

Due to the extensive sugarcane cultivation documented within the project area, mechanized land modifications associated with sugar cane cultivation has likely disturbed and/or destroyed any pre-contact historic properties that may have been present. Additionally the project area is situated primarily within in-use roadways and old cane haul roads, which have caused additional land modifications within the project area, disturbing and/or destroying historic properties. Thus, the probability of encountering surface historic properties would be low.

3.8.3. Community Consultation Results

This section summarizes the input received from those consulted. According to community contacts, they've indicated that the project improvement areas and vicinity are likely to have surface and subsurface cultural and historic properties, including human skeletal remains. Several of the study participants were concerned about iwi kupuna (ancestral remains) and cultural and historic properties in or near the project area.

- Mr. Clyde Namu'o of OHA stated, "Numerous cultural sites including, but not limited to heiau complexes and fishing shrines are situated within the assessment area and community groups are actively working to preserve these cultural sites for future generations."
- Ms. Stella Burgess says that it is likely that iwi kpuna will be found in Kukui'ula and Kōloa which are full of underground lava tubes. She recommends that if any cultural historic properties, such as iwi kpuna are found, the construction should stop. She hopes that the project proponent will be sensitive toward cultural issues and the project will keep "above board" and if anything is found, it should be reported. She recommends a special place to be designated for the iwi kpuna and they should be put back as quickly as possible not to create another Wal-Mart situation. She would like to be contacted if any iwi kūpuna or other cultural historic properties are found.
- Mr. Francis Ching states that because most of the project area is on sugar cane lands that were previously harrowed, it is most likely that very few sites will be found. However, if burials are found, they will be easily identified by looking at the stones closely. The walls in burials are nicely lined up. If they aren't, they are probably sweet potato mounds. He recommends that a cultural monitor be present during construction.
- Kōloa Resident #2 says that there are additional significant cultural resources that have not been adequately documented and assessed by prior historic-preservation work. She says that to her knowledge no one has surveyed the underground caves. She says that many of the burial sites between Kōloa and Po'ipū, where current projects are being built, were not recorded.
- Mr. Randy Wichman voiced his concerns with the proposed project in the mauka regions of Po'ipū saying, the project proponent, "will actually being taking out some of the sites, although originally designated to be taken out or data recovery, we lose those [sites]." He is concerned the project proponent will breach the railroad berm.

He also mentioned that “within the actual footprint of the Hapa Road area there may be some real sensitive issues because there are a lot of things going on right now, like the law suit.” He recommends a higher level of sensitivity be used in the Hapa Road area. Although the project will be near the edge of Hapa Road, he asks the area be looked at as part of the whole scheme and seen as such.” He is also concerned with the “affect the project may have on the Kāne I Olo Uma site because it had that serious agriculture component.”

- Mr. Rupert Rowe is also concerned for the safety of the Kāne I Olo Uma site on the edge of the project area.

The project area and environs was commented to have a long history of use by Kānaka Maoli (native born), and other kama'āina groups for a variety of cultural activities including fishing, the gathering of plants and fruits like mountain apple (*Syzygium malaccense*), java “choke plum” (*Syzygium cuminii*) and 'ilima (*Sida*). Community participants expressed concern that mauka access is restricted as a result of past development, and that access to cultural and natural resources have been disrupted. Two participants shared their concerns about the limited access of Waita Reservoir which is impeding cultural practices. One participant mentions ongoing gathering of plants in the project area.

- Ms. Beryl Blaich says, “Since the plantation closed, the community has lost access to Waita Reservoir where there are now commercial operations, as well as to the cane haul road along the mill, which the community traditionally used to go to Mahaulepu, and to the valleys and ridges where pigs were hunted and people did gather plants.” She continues by saying that although landowners and lessees are concerned about liability, vandalism and already commit money to management of the area, community members resent their exclusion to formerly used areas.
- Kōloa Resident #1 recalls fishing in Waita Reservoir as a child and thinks that access should be granted to the public. He says that the children of today should be able to go fishing at Waita.
- Ms. Stella Burgess mentioned flowers are often gathered in the project area, specifically 'ilima from the Pu'u Wanawana area to the former cane fields.

Ms. Beryl Blaich from the Malama Mahaulepu organization expressed other comments which are noted below:

- A concern with the wild pigs from the mauka regions making their way to the coastal area. These wild pigs have created a problem in the native plant restoration project of Grove Farm lessees, and she is unsure if the pigs are also a problem for the GMO corn operation starting in Paa and Mahaulepu.
- Concern was expressed with the project's visual impacts to Pu'u Wanawana, Pu'u Hunihuni and Pu'uhi Reservoir. “We are concerned about the visual impact of the proposed eastern pump station and the crater pump station on these puu, especially looking mauka from the coast to the mill.”

- Concerned was expressed with historic preservation of the Kōloa Mill. She says, “The mill itself is a historic icon. From the Makawehi and Punahoa limestone headlands on the coast, the mill presents a distinctive profile yet does not obscure the singular coastal craters. Ideally, the mill will not be demolished but reused and no future structure near it will obscure or dominate it.”
- Concern about possible environmental impacts on two of the craters was expressed. After the winter rainy season, they hold intermittent lakes that are frequented by migratory water birds. She is concerned that the wastewater plant will cause the birds of the area to become endangered.

Mr. Randy Wichman expressed his concerns with the cost of the project saying, “The massive drilling through bedrock. If they actually commit to the directional drilling, my guess it is going to be really expensive. It is probably easier for them to just carve a trench through then it is to drill. So cost wise it will be a lot more expensive.”

Community members expressed a desire for a preservation or development plan for the area.

- Ms. Beryl Blaich recommends for the Kōloa-Po'ipu-Kalaheo development plan to be updated. She states that there “is a need for [a] master plan for this important area as well as for the development plan [to] update Kōloa’s undeveloped lands.”
- Mr. Rupert Rowe states, there is “no plan for preservation” and that Kaua’i is, “the only county with no evacuation plan or signs.”

Community members recommended the project proponent discuss the project with the community or look to the past to solve planning problems.

- Ms. Stella Burgess recommends the developers ask for help when dealing with cultural issues. She advises the project proponents to consult with the community in general and in particular with Grace Bacle, whose family comes from the South Shore.
- Kōloa Resident #1 recommends the project proponent hold public meetings and update the community on the proposed project.
- Mr. Randy Wichman mentioned the importance of place names and their association with the history of Kōloa. He also mentions it is important that the exact footprint is known for public view where this pump station is going to be.
- Ms. Wilma Holi stated project planners need to go back into the history of Kōloa and Po'ipu to understand how was the community designed.

A few community members voiced concerns or recommendations regarding water resources in the project area.

- Mr. Randy Wichman stated, “Part of the reclamation of the water since it is good for irrigation could be considered for ‘auwai use. It might be worth considering as a concession in this particular area that it would be done.”
- Ms. Wilma Holi voiced concerns about the lack of water and the source of water for this project. She also stated concern for the many dry streams and river beds and that there is a new reservoir but no water in stream. She also recommended recycling the waste to be used for soil.
- Mr. Tommy Oi voiced the benefits of the project saying the proposed project, “would be a better way to contain all your sewage and waste. Most waste will be contained. I know that they can recycle the water. A lot of that water can be used by the community and for irrigation. It is just something that is going to help the area so I don’t have any concerns.”

Some participants were concerned with the smell and noise that may be generated from the Pump Stations.

- Kōloa Resident #1 is most concerned with the smell the Kōloa Pump Station will generate. The Kōloa Pump Station is very close to his home.
- Kōloa Resident #2 hopes that there will be no odor or noise from the facility at the Mill.
- Ms. Wilma Holi is concerned with “The smell of waste is everywhere.”

Kōloa Resident #2 recommended that the project proponent take responsibility for cleaning the area near the old Kōloa Mill. It was suggests the project proponent clean the area by removing abandon cars and other garbage in the area, and making the area more presentable, instead of just being a “brownfield.”

A couple participants voiced concern that they would be forced to hook up to the new sewage system which would be expensive. They were also concerned the project will lay the pipes through their backyards and property.

- Kōloa Resident #1 believes the project is unnecessary and he will probably not hook up to the system. He stated that many of the Kōloa community members he knows are satisfied with the current cesspool system they have and also will not hook up. He believes this project will benefit upcoming businesses and the Kōloa Creekside subdivision, not the existing community members.
- Kōloa Resident #2’s family is also concerned about the cost of hooking up to the sewage system. They explained that many community members had recently renovated their cesspools after Hurricane ‘Iniki. They also do not want project pipes in their backyards and properties.

Some participants expressed sadness, frustration, or negative feelings about the overall cumulative impacts of ongoing and future developments in Kōloa-Po'ipū as contributing to the loss of what is authentic and traditional about the area.

- Kōloa Resident #1 sees this project as “opening the door to more development” in the Kōloa -Po'ipu area.
- Kōloa Resident #2 is concerned about the project's long-term impacts on the community. She stated that new infrastructure (sewer system, new water system, etc) may mean that a significant zoning change or large development project is anticipated and thus, foresees this project supporting more (new) development in the future. Her family expressed frustration with the ongoing development of the Kōloa-Po'ipu area. Kukui'ula has especially brought out a lot of negative sentiments from the community.
- Mr. Rupert Rowe states that, “the traditional cultural practices are affected by population growth in the project area: All the fishing in this area is not the way it once was before we could fill a couple coolers. Shoreline everything has changed. More people, the environment has changed and thus changed our culture.”

3.8.4. Probable Impacts and Mitigation Measures

Several of the consulted participants expressed concern that the proposed project may negatively impact Hawaiian and Kōloa community members' beliefs, resources, and practices. Based upon evaluation of the comments and concerns expressed by the individuals, it appears that many of the issues raised concern prior events associated with the history of the region, County related land use policies, and other factors beyond the control and jurisdiction of the Applicant concerning this project. Other issues can be addressed by implementing appropriate mitigative measures most of which are covered in other sections of this document. Discussion addressing these concerns raised along with proposed mitigative measures is provided.

1. Impacts on surface and subsurface cultural and historic properties.

Based on archival evidence and community consultation, it is possible that there are human skeletal remains as well as significant cultural and historic properties in the project area that could be affected. Based upon the archaeological inventory survey conducted for this project, significant historic properties identified were mainly associated with the Po'ipū Collection System route, and mitigative measures recommended. Proposed measures include:

- a. A cultural resource preservation plan prepared to address buffer zones and protective measures for SIHP #50-30-10-992, a post-contact road (Hapa Road).
 - Additionally, the cultural resource preservation plan should address SIHP #50-30-10-947 (post-contact railroad berm) and SIHP #50-30-10-953 (pre-contact probable burial platform) also located in the vicinity of this sewer line corridor.
 - This preservation plan should detail the short- and long-term preservation measures that will safeguard the historic properties during project construction and subsequent operations within the project area.

- b. An archaeological monitoring program be prepared and implemented prior to construction. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered.
 - The monitoring specifics will be addressed in an archaeological monitoring plan prepared, reviewed, and approved by the SHPD.
 - If human burials are found, cultural and lineal descendants of the area would be consulted with regard to a burial treatment plan. This would include Ms. Stella Burgess in the consultation.
- c. Additional measures that can be implemented include the following.
 - Personnel involved in construction activities be informed of the possibility of inadvertent cultural finds, including human remains, and proper procedures.
 - Consultation with cultural and lineal descendants of the area would be conducted during the preparation of the cultural resource preservation plan and archaeological monitoring program.
 - Provide continued consultation with identified cultural and lineal descendants to keep them informed of construction activities.

Regarding concerns with burial sites between Kōloa and Po'ipū not being recorded and current projects being built there, the Applicant will need to defer to the landowners for those properties to more appropriately address this. The Applicant has no control or jurisdiction over matters of other privately-owned properties. Also, there were no underground caves identified within the collection system route or at the Kōloa Mill site. The project should not impact the Kāne I Olo Uma site and the cultural resource preservation plan prepared will further help ensure this.

2. Restriction of mauka access from past development disrupting access to cultural and natural resources.

The project will not impact or further restrict access to the Waita Reservoir or other mauka lands that may have been previously used for cultural activities. Those areas are privately owned, and the Applicant has no control or jurisdiction of those surrounding areas or the activities presently occurring there. The sewer collection system will not restrict any access since the sewer lines would be located underground. The project will also not affect access to Pu'u Wanawana which is situated well away from the sewer collection system routes.

3. Concerns from Ms. Beryl Blaich of Malama Mahaulepu.

The project will have no effect on wild pigs from mauka regions that make their way to the coastal area and create problems for lessees in the area. Control of the pigs would more appropriately fall under the jurisdiction and control of the area's landowner.

The Eastern and Crater wastewater pump stations would have no visual impact on Pu'u Wanawana, Pu'u Hunihuni and Pu'uhi Reservoir. The majority of the pump station would be located underground. Only accessory equipment such as an electrical box would be situated above ground. These equipment are not expected to be visible from public views sites along the coastline mauka toward the mill.

The previous section discussed the project's effect on the Kōloa Mill. The bagasse building and water tank planned for adaptive reuse are not historic properties and the project would not have any direct impacts. Retaining and reusing the water tank and bagasse storage building will allow the sugar mill complex to remain intact. To mitigate any indirect effects on the Kōloa Mill, additional digital photographs documenting the water tank and bagasse storage building would be taken and provided to the SHPD.

The project improvements would not have an impact on the two craters or migratory water birds that may visit the intermittent lakes within the craters. The project would not cause such water birds to become endangered. The only project improvements in the areas of the craters would be the sewer collection system of which the sewer lines would be situated underground.

4. Concerns from Mr. Randy Wichman on project costs.

The Applicant will evaluate the project costs and determine the most appropriate construction method while trying to minimize impacts to the surrounding environment.

5. Desire for a preservation or development plan for the area.

The update of the Kōloa-Po'ipu-Kalaheo development plan more appropriately falls under the jurisdiction of the County. The Applicant would coordinate with the County in providing necessary project information. Similarly, a preservation plan would be more appropriately included as part of the County's update of a development plan for the region since such actions involve a larger regional action that needs to be coordinated with major landowners. Any evacuation plan or signage would also fall under the County's civil defense agency or the State civil defense agency.

6. Discuss the project with the community or look to the past to solve planning problems.

The Applicant has consulted with the community by giving presentations to community associations as discussed in other sections of this document. The Applicant also intends to continue consulting with the community to keep them apprised of this project and progress. They will also seek assistance from the community when dealing with cultural issues as appropriate. The County would be the more appropriate authority to look into the history of Kōloa and Po'ipu to

understand how the community was designed, and the update of their development plan for the region would be the opportunity to address this.

7. Concerns regarding water resources in the project area.

The Applicant will be using the R-1 effluent water for reuse as part of landscaping for other uses in the region. The treatment facility would not utilize much water because it will be processing wastewater. Existing water infrastructure serving the mill is still present in the area and is planned to be used to meet the facility's needs. Appropriate coordination with the County would be conducted during the design phase in addressing water requirements. The project and use of potable water would not impact streams which are usually served by surface water resources.

8. Concerns with the smell and noise that may be generated from the pump stations.

The wastewater pump stations are not expected to generate significant odors from their operation. As discussed in other sections of this document, the project will include necessary equipment at the treatment facility and pump stations to properly mitigate and address potential odor issues.

9. Responsibility for cleaning the area near the old Kōloa Mill.

The Applicant is not responsible for the clean up of the mill and surrounding area removing abandon cars and other garbage in the area. That responsibility is with the landowner of the subject property.

10. Concern with being required to connect to the new sewage system.

Homeowners are not required to connect to the new regional wastewater system. The system is privately owned and therefore homeowners and other landowners can choose to connect to the system if they desire. The sewer collection system routes are discussed in this document and would be routed along existing roadways in developed areas and therefore not affect single-family residences or their backyards.

11. Concern with cumulative impacts of ongoing and future developments in Kōloa-Po'ipu.

The County of Kaua'i is responsible for permitting future developments in the region, and such decisions are made as part of their regulatory entitlement process. The project will have minimal if any influence in development decisions by property owners since those decisions are usually based upon other critical factors such as market and economic feasibility. Long-term policy decisions regarding land use patterns in the area would be more appropriately addressed by the County. The project is intended to provide necessary wastewater service to both existing and future planned areas as discussed in Chapter 2. It will allow existing LCCs to be closed and individual packaged treatment plants to connect to this regional system.

4. HUMAN ENVIRONMENT: ENVIRONMENTAL SETTING, PROBABLE IMPACTS, AND MITIGATIVE MEASURES

This chapter addresses the environmental setting generally associated with the human environment in the project area, discusses the environmental impacts of the Project on the various resources, and identifies pertinent mitigative measures, if applicable.

4.1. Air Quality

An air quality study was conducted by B.D. Neal and Associates (BDNA). The purpose of this study was to describe existing air quality in the project area and to assess the potential short- and long-term direct and indirect air quality impacts that could result from construction and operation of the proposed facilities. A copy of this report is included in Appendix G of this document.

Ambient Air Quality Standards

National and State AAQS have been established for particulate matter less than 10 microns (PM₁₀) and 2.5 microns (PM_{2.5}), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead (Pb), and ozone (O₃). The State has also set a standard for hydrogen sulfide (H₂S). National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants.

National primary standards are designed to protect the public health with an “adequate margin of safety”. National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from “any known or anticipated adverse effects of a pollutant”. Hawai'i State AAQS are given in terms of a single standard that is designed “to protect public health and welfare and to prevent the significant deterioration of air quality”. A summary of the federal and Hawai'i ambient air quality standards is presented in Table 4-1.

4.1.1. Present Air Quality

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, industrial sources, agricultural operations, and to a lesser extent by natural sources. Much of the particulate emissions on Kaua'i originate from area sources, such as the mineral/aggregate products industry and agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and industrial boilers. Nitrogen oxides emissions emanate predominantly from area sources (mostly motor vehicle traffic), although industrial point sources also contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources.

Air Pollutant	Averaging Time	Hawai'i AAQS	Federal (NAAQS)	
			Primary	Secondary
Carbon Monoxide (CO)	8-hour	5 mg/m ³	10 mg/m ³	--
	1-hour	10 mg/m ³	40 mg/m ³	--
Lead (Pb)	Quarterly	1.5 µg/m ³	.15 µg/m ³	.15 µg/m ³
Nitrogen Dioxide (NO ₂)	Annual	70 µg/m ³	100 µg/m ³	100 µg/m ³
Ozone (O ₃)	8-hour	157 µg/m ³	157 µg/m ³	157 µg/m ³
	1-hour	--	235 µg/m ³	235 µg/m ³
Particulate Matter ≤10 micrometers in diameter (PM ₁₀)	Annual	50 µg/m ³	--	--
	24-hour	150 µg/m ³	150 µg/m ³	150 µg/m ³
Particulate Matter ≤2.5 micrometers in diameter (PM _{2.5})	Annual	--	15 µg/m ³	15 µg/m ³
	24-hour	--	35 µg/m ³	35 µg/m ³
Hydrogen Sulfide (H ₂ S)	1-hour	35 µg/m ³	--	--
Sulfur Dioxide (SO ₂)	Annual	80 µg/m ³	80 µg/m ³	--
	24-hour	365 µg/m ³	365 µg/m ³	--
	3-hour	1300 µg/m ³	--	1300 µg/m ³

Source: B.D. Neal & Associates, 2009

Arterial roadways in the project area, such as Kōloa Road, Maluhia Road, Po'ipū Road and Ala Kinoiki Road, presently carry moderate to heavy levels of vehicle traffic during peak traffic hours. Some of the emissions from motor vehicles using these roadways, primarily nitrogen oxides and carbon monoxide, will tend to be carried over portions the project site by the prevailing winds.

Sources of industrial air pollution are located at Port Allen, which is located about 8 miles to the west. These industrial sources emit sulfur dioxide, nitrogen oxides, particulate matter, carbon monoxide and other air pollutants. Prevailing winds from the east or northeast will carry these emissions away from the project area most of the time.

Until recently, air pollution in the project area originating from agricultural sources could mainly be attributed to sugar cane operations. Emissions from both the mill and much of the cane field operations in the area have now been eliminated with the closure of the Kōloa Sugar Mill. Minor emissions of dust may occur from farming and ranching activities. Natural sources of air pollution emissions that also could affect the project area but cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the island of Hawai'i.

The State Department of Health operates a network of air quality monitoring stations at various locations around the State, but very little data is available for the island of Kauai. Available data on average annual concentrations for particulate (PM₁₀) made in Lihue between

the years 2002 through 2006 ranged from 11 to 16 $\mu\text{g}/\text{m}^3$. Values reported were within the State and national AAQS.

Although very little ambient air quality data is available to characterize existing conditions, due to the relatively small number of emission sources in the project area, it is likely that all ambient air quality standards are currently being met except perhaps for small areas around industrial sources or near traffic congested locations.

4.1.2. Probable Impacts and Mitigation Measures

Short-term impacts on air quality in the immediate project area may result from construction activities. Two potential types of pollutants are fugitive dust emissions from vehicular movement and soil excavation. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. Indirectly, there could also be short-term impacts from slow-moving construction equipment traveling to and from the project site, from a temporary increase in local traffic caused by commuting construction workers, and from disruptions to normal traffic flow caused by lane closures of adjacent roadways.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately because emissions varies greatly depending upon the soil type at the site, the amount and type of dirt disturbing activity, and the wind speed. However, the EPA provides a rough estimate of 1.2 tons of uncontrolled fugitive dust emissions per acre per month under conditions of "medium" construction activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions from the project site would likely be near that level depending on the amount of rainfall that occurs.

Operation of the treatment facility will result in only minor amounts of air pollution emissions. These emissions will occur in the form of exhaust emissions from occasional operation of the emergency diesel generator and as odorous emissions from wastewater treatment operations. Operation of the on-site emergency diesel generator is expected to occur only a few hours per year during power outages and during scheduled testing and operation of the generator. Annual emissions from the infrequent use of the emergency generator will be minimal, and therefore any impacts on air quality should be negligible.

Effects from Plant Operation

Wastewater treatment plants generally are not considered significant sources of air pollution, but they can result in the release of small amounts of airborne odorous compounds. The types and amounts of compounds in the air are generally not considered hazardous to human health, but when they occur at sufficiently high concentrations at off-site locations, they can be detected by smell and potentially constitute a nuisance for nearby residents and

businesses. Odorous compounds commonly associated with wastewater treatment systems include hydrogen sulfide, ammonia and volatile organic compounds (VOC). These compounds are typically emitted into the atmosphere from wastewater collection, treatment and storage systems through volatilization at the liquid surface.

Temperature is a factor in the rate of volatilization, and typical temperatures at the project site will be relatively warm which will tend to promote volatilization. The prevalent trade winds could potentially further support volatilization at the plant, but they will also tend to enhance the dilution and dispersion of the emissions at downwind locations. With trade wind conditions, emissions will be carried toward locations to the southwest of the project site.

From an atmospheric dispersion perspective, it is probable that the worst case for off-site odor impacts will occur during nighttime situations when the trade winds are weak or absent and dispersion conditions are poor. Under trade wind conditions, it is estimated that concentrations will be diluted and dispersed by a factor of about 4,000 at a distance of 1,000 ft from the project site. During nighttime drainage flow conditions when the trade winds are weak or absent, concentrations at a distance of 1,000 ft will likely be reduced by a factor of only about 200.

Mitigative Measures

State air pollution control regulations prohibit visible fugitive dust emissions at the property line. Hence, an effective dust control plan for the project construction phase would be implemented to minimize any air quality impacts. Emissions can be controlled by watering active work areas, using wind screens, keeping adjacent paved roads clean, and covering open-bodied trucks. Other dust control measures could include limiting the disturbed area at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program.

Open-bodied trucks would be covered at all times in motion if they are transporting materials that could blow away. Tire washing may also limit haul trucks tracking dirt onto paved streets from unpaved areas within the property. Paving of parking areas and/or the establishment of landscaping early in the construction schedule can also lower potential fugitive dust emissions.

Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours. The moving of heavy construction equipment should occur during periods of low traffic volume, and arranging schedules of commuting construction workers to avoid peak traffic hours in the project vicinity. The details of these construction plans and contractor coordination would be further determined as part of the project's design. Measures developed would also be designed to make construction activities comply with the State Department of Health's (DOH) Administrative Rules Title 11, Chapter 60 (Air Pollution Control).

Compatible location and plant design are important factors for mitigating or avoiding nuisance odor issues associated with wastewater treatment facilities. The proposed treatment facility will utilize treatment processes similar to an existing Po'ipū WRF, however, this project's design intention is to put as many of the treatment tanks as possible inside the existing bagasse building. Further, any tanks located outside will be covered and the off-gas treated with an odor control system. It is expected that enclosing many of the tanks in the bagasse building and covering and treating any outdoor tanks will substantially eliminate any nuisance odor issues associated with the facility.

Odor control systems will also be provided at wastewater pump station sites. These units will be sized for the anticipated hydrogen sulfide generation in the wet wells. About 10 to 12 air changes per hour will be utilized in the odor control system design to minimize odor concerns near surrounding uses.

4.2. NOISE

A noise impact study was conducted by D. L. Adams and Associates (DLAA). The purpose of this study was to describe existing noise environment in the project area and to assess the potential impacts that could result from construction and operation of the proposed facilities. A copy of this report is included in Appendix H of this document.

4.2.1. Noise Standards and Guidelines

State and Federal agencies have established guidelines and standards for assessing environmental noise impacts and have set noise limits as a function of land use. Noise programs, goals, and policies are administered by the State DOH, the U.S. Federal Highway Administration (FHWA), and the State DOT.

The Regional WRF Project would not be a source generating moderate or significant increases in vehicular traffic to this region. The operation of the wastewater collection system (WWPS and sewer lines) would not generate additional traffic on surrounding roadways during the weekday peak commuter periods. The regional treatment facility would generate a few vehicle trips during the weekday commuter periods due to operational staff working there. However, these few employees (about 5) working at the facility would have minimal if any noticeable effect on traffic conditions in the surrounding area. Therefore, the discussion of noise standards and guidelines focuses on the State DOH regulations.

State DOH, Community Noise Control

Under Title 11, Chapter 46 (Community Noise Control), HAR, the State DOH defines three classes of zoning districts with corresponding maximum permissible sound levels due to stationary noise sources such as air-conditioning units, exhaust systems, generators, compressors, pumps, and equipment related to agricultural, construction, and industrial activities. These rules do not address most moving sources of noise such as vehicular traffic.

However, the regulation does regulate noise related to agricultural, construction, and industrial activities, which may not be stationary.

The maximum permissible sound levels are enforced for any location at or beyond the property line and are not to be exceeded for more than 10 percent of the time during any 20-minute period, except by permit or variance. The zoning district classification and maximum permissible sound levels are summarized in Table 4-2 below.

Table 4-2 State DOH Community Noise Level Classification of Zoning Districts and Maximum Permissible Sound Levels		
Zoning District	Maximum Permissible Sound Levels (dBA)	
	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Class A: Includes all areas equivalent to lands zoned residential, conservation, preservation, public space, open space, or similar type.	55	45
Class B: Includes all areas equivalent to lands zoned for multi-family dwellings, apartment, business, commercial, hotel, resort, or similar type.	60	50
Class C: Includes all areas equivalent to lands zoned agriculture, country, industrial, or similar type.	70	70

4.2.2. Existing Acoustical Environment

Ambient noise level measurements were conducted in January 2009 to assess the existing acoustical environment in four different locations within the project area. These areas consisted of: 1) site of the Regional WRF; 2) Eastern WWPS; 3) Villages WWPS; and 4) Kōloa WWPS. Continuous, hourly, statistical sound levels were recorded for approximately 48 hours at each location.

Regional WRF Site

The proposed Regional WRF site consists predominantly of abandoned structures associated with the former mill operations and undeveloped land area. The areas surrounding the site consist of mostly vacant agricultural land and an all-terrain vehicle (ATV) commercial operation. The hourly L_{eq} noise levels at the former Kōloa Mill site generally ranged from 50 dBA to 55 dBA and the calculated day-night level, L_{dn} , for the measurements period was 61 dBA. Dominant noise sources at this site included environmental noises such as wind and birds. Secondary noise sources include light industrial uses at the former Mill site and infrequent vehicular traffic along the access road.

Kōloa Wastewater Pump Station Site

The Kōloa WWPS will be located on an undeveloped parcel situated near the southwest corner of the Weliweli Road and Waikomo Road intersection. The vacant parcel is surrounded by a residential community with the pump station situated about 100 to 200 feet away from the nearest existing residences. The hourly L_{eq} noise levels at this site generally ranged from 50 dBA to 60 dBA and the calculated day-night level, L_{dn} , for the measurements period was 61 dBA. Dominant noise sources at this site include vehicular traffic noise from Weliweli and Waikomo Roads. Secondary noise sources include environmental noises such as wind and birds.

Villages Wastewater Pump Station Site

The Villages WWPS will be located on an undeveloped site off of Hapa Road and adjacent to the existing Kiahuna Swim and Tennis Club. The vacant land mauka of the site will likely be developed as a residential community in the future. The hourly L_{eq} noise levels near this pump station site generally range from 45 dBA to 60 dBA and the calculated day-night level, L_{dn} , for the measurements period was 57 dBA. Dominant noise sources at this site include traffic noise from Kiahuna Plantation Road and the adjacent commercial facility. Secondary noise sources include environmental noises such as wind and birds

Eastern Wastewater Pump Station Site

The Eastern WWPS will be situated adjacent to the existing packaged wastewater treatment plant serving the Grand Hyatt Resort and Spa. This site is currently vacant and is located just east of the Po'ipū Bay Golf Course. The hourly L_{eq} noise levels near this site generally range from 50 dBA to 60 dBA and the calculated day-night level for the measurements period was 62 dBA.

Dominant noise sources at this site include environmental noises such as wind and birds. During the night time hours when ambient noise levels generally reduce significantly, noise levels did not drop below 50 dBA due to static mechanical noise from the adjacent wastewater treatment plant. Secondary noise sources include traffic noise from Po'ipū Road, noise from the adjacent golf course.

Crater Wastewater Pump Station Site

The Crater WWPS will be located within an undeveloped site east of the existing water tanks near Puuhi Reservoir. The area surrounding the site is zoned as agricultural. Long term noise measurements were not conducted at the Crater WWPS site because the areas surrounding the site were not considered noise-sensitive. Dominant noise sources at this site likely include traffic noise from Weliweli Road, noise from occasional farming equipment and environmental sources such as birds and wind.

4.2.3. Probable Impacts and Mitigation Measures

Short-Term Construction Related Impacts

Construction of the Regional WWRF and the four pump stations will involve excavation, grading, and other typical construction activities. Construction of sewer lines and gravity mains will involve cutting of existing pavement, trenching, grading, laying of water lines, paving, filling, and movement of construction vehicles. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process.

Most of the facilities are surrounded by agricultural land and are not considered noise sensitive. However, the Kōloa and Villages WWPS are located adjacent to existing commercial or residential areas which may be impacted by construction noise.

Portions of the wastewater collection system lines would be routed within private property and within and along several county roads. Most of these sewer lines will be routed through private agricultural land. However, there are commercial and residential uses situated along Po'ipū Road near the proposed Villages WWPS and along the mauka end of Weliweli Road at the Kōloa Road intersection. These areas can be considered noise sensitive and will be impacted by nearby construction noise. Construction noise levels are expected to exceed both daytime and nighttime limits and a permit would need to be obtained from the State DOH to allow the operation of construction equipment.

During the construction period, residences and businesses in the surrounding areas may experience slightly heavier traffic due to construction workers traveling to and from the construction site. Also, construction of the collection system may have some temporary disruptions and re-routing of vehicles along roadways affected. However, these construction related traffic effects would only be temporary and should have minimal if any effects on traffic noise in the region.

Regional WRF Impacts

The various wastewater treatment processes will incorporate stationary and non-stationary mechanical equipment during the treatment of wastewater at the regional facility. Pumps, blowers, and emergency generators will likely be the loudest equipment installed at this treatment facility.

Noise from this equipment would need to meet the State noise rules that stipulate maximum permissible noise limits at the property line. For areas zoned agricultural, the property line noise limits are 70 dBA during the day and night. Future development plans for the remaining portion of the former Kōloa Mill site along with adjacent areas have not been determined at this time. However, it is expected that any future uses of the mill site will be consistent with the current agricultural zoning. Accordingly, the property line noise limits would be 70 dBA during both the day and at night.

A sound propagation model was developed for the proposed Regional WRF in order to estimate future noise levels at the property line. The results of the mechanical noise analysis for the Regional WRF are graphically shown on a noise contour map in Figure 4-1. Under the agricultural zoning for this site and adjacent area, the estimated noise would be within the 70 dBA limits.

It is expected that traffic levels in the future will not be affected by the operation of the Regional WRF and associated collection system. Therefore, a future traffic noise impact due to the operation of this project is not expected.

Wastewater Pump Station Impacts

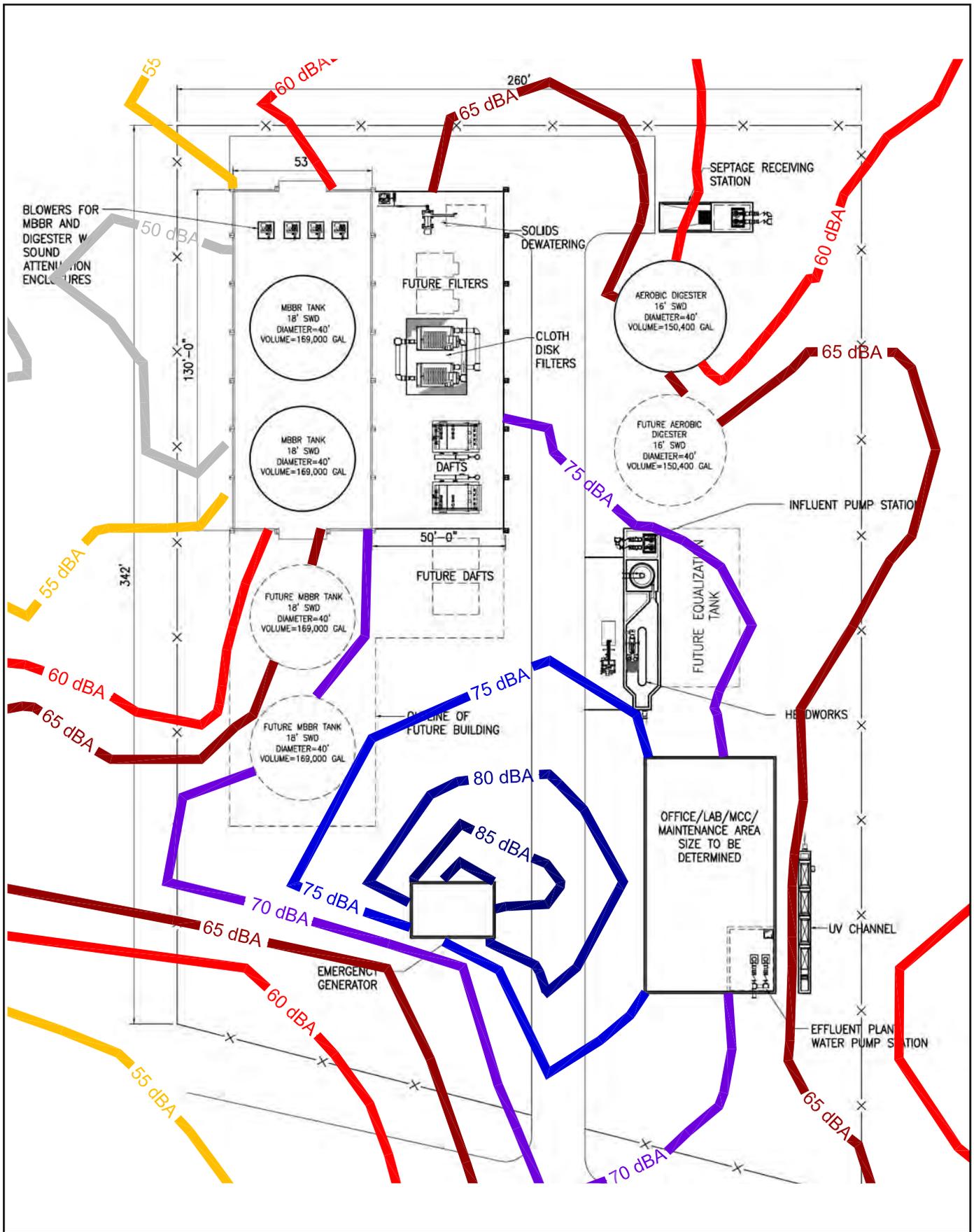
The four (4) wastewater pumping stations will also incorporate stationary and non-stationary mechanical equipment to convey the flow of wastewater to the Regional WRF. The emergency generators will be the loudest equipment installed at the facilities and must meet the State noise rules during monthly testing. Submersible pumps and blowers will also be a source of noise at the WWPSs and must meet the State noise rules.

It is expected that mechanical noise from the emergency generators will exceed the State DOH property line noise limits during monthly testing. For areas zoned commercial, the property line noise limits are 60 dBA during the day and 50 dBA during the night time hours. For areas zoned residential, the property line noise limits are 55 dBA during the day and 45 dBA during the night time hours. Therefore, mitigation of mechanical noise to meet the State DOH maximum permissible noise limits should be incorporated into the project's design.

Mitigative Measures

Where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels, a permit should be obtained from the State DOH to allow the operation of vehicles, cranes, construction equipment, power tools, etc., which emit noise levels in excess of the permissible levels. The Contractor would be required to submit a noise permit application to the State DOH which describes the construction activities for the project. Prior to issuing the noise permit, the State DOH may require action by the Contractor to incorporate noise mitigation into the construction plan.

The State DOH may also require the Contractor to conduct noise monitoring or community meetings inviting the neighboring residents and business owners to discuss construction noise. The Contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc. However, the State DOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities.



Source:
DLAA Noise Assessment Report

FIGURE 4-1
NOISE CONTOUR MAP FOR REGIONAL WRF

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC



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

- No permit shall allow construction activities creating excessive noise before 7:00 a.m. and after 6:00 p.m. of the same day.
- No permit shall allow construction activities that create excessive noise before 9:00 a.m. and after 6:00 p.m. on Saturdays.
- No permit shall allow construction activities which exceed the allowable noise levels on Sundays and holidays.

Although the predicted noise levels at the property line for the treatment facility site would meet the 70 dBA during both the day and night time hours, it is recommended to minimize noise generation whenever practicable. Therefore, the design of the wastewater reclamation facility along with the pump stations should give consideration to controlling noise emanating from mechanical equipment so as to comply with the State Department of Health Community Noise Control rules. The following lists general methods for source control which should be considered for the noisier pieces of mechanical equipment proposed for the Regional WRF and the four WWPS.

- | | |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emergency Generator: | • - Install the emergency generator in a building. |
| | - Install a critical (or higher) grade exhaust muffler. |
| | - Install duct silencers and acoustical louvers at the air intake and discharge paths. |
| Blowers: | - Install blowers with a pre-manufactured acoustical enclosure. |
| Pumps: | - Enclose pumps in an equipment room or building. |
| Buildings: | - Buildings which house noisy mechanical equipment should be constructed of materials that prevent the transmission of noise to the exterior, such as concrete or CMU block. |
| | - Acoustical louvers should be installed in all ventilation openings. • |
| | - Doors should be sealed with head and jamb seals and door bottoms. • |
| | - The interior of the mechanical rooms should be lined with sound absorptive material. |

4.3. HAZARDOUS MATERIALS

A Phase I Environmental Site Assessment (ESA) was conducted for the project by Myounghee Noh & Associates, L.L.C. (MNA) and is included in Appendix I of this document. The purpose of this Phase I ESA was to identify and evaluate any recognized environmental conditions within the project area, with respect to the range of contaminants designated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. The scope of this work included the following tasks:

1. Perform a site reconnaissance to identify any likelihood of contamination, interview available personnel, and conduct a brief assessment of any adjoining properties.
2. Review published information on surface or subsurface conditions at the site and surrounding area to identify previous and current uses of the project site, adjoining properties, and surrounding areas.
3. Review government records with respect to environmental conditions, citations, complaints, and permits at the site, adjoining properties, or surrounding areas.

4.3.1. Past Uses and Records Research

Past Uses of Adjoining Properties

Adjoining parcels are unlikely to affect the treatment facility project site and were thus not investigated under the assessment. This is because the project site only occupies a portion of a tax parcel, and because the tax parcels involved are so large (over 1,000 acres). However, the areas within parcels (4) 2-09-001: 001 and (4) 2-09-002: 001 adjacent to and surrounding the project site were assessed for their ability to impact the subject property.

Historical use of the area adjacent to project site is the sugar mill and auxiliary buildings. To the south of this project site is Mahaulepu Road. Across the road were agricultural fields historically used for sugarcane production. More recently portions of these fields situated south of the site may have been used by Pioneer Seed for corn seed production. The area to the east has served as a base yard for Wa'alani Enterprise since 1999.

The sugar mill has been vacant since it closed in 1996. The area west of the mill contains several tenants. However, this area is not believed to have the potential to impact the project site based on proximity, topography, and site activities. To the north of site are sugar mill ancillary facilities and open space. Beyond that is an area used by Trashco as a base yard for refuse containers. This area is not believed to have the potential to impact the subject property based on proximity, topography, and site activities.

The areas adjacent to the planned infiltration basin were historically used for sugarcane production. The area east of this basin is currently used by Wa'alani Enterprises, and has been excavated and used for off-site fill material.

Government Records Review

MNA conducted searches of standard federal and state government databases of known or potential sources of hazardous materials or waste that may have been present within or near the project site. Of the various databases searched, all of them except two State databases identified no sites, spills, or generators of hazardous waste within the 0.25 to 1.0 mile vicinity of the treatment facility project site. Additional research was conducted to obtain additional information associated with the two State databases.

A review of case files available at the State DOH, Office of Hazard Evaluation and Emergency Response (HEER) was conducted. A Notification Report for a release of a reportable quantity of oil that occurred on August 20, 1994 contained limited information. This report stated that five gallons of oil were released to a building interior as the result of an overflow while filling a piece of equipment. The oil flowed from the floor to some type of water and eventually dissipated. No cleanup, release response, or subsequent investigation appears to have occurred. The State DOH's HEER Office Emergency Preparedness and Response Section issued a No Further Action Status for the release indicating that no additional time sensitive action needed to be taken.

Other records indicated that McBride Sugar Company operated a maintenance shop at the mill facility. No citations or regulatory action was taken against that company based on activities at the maintenance shop. However, there was concern over releases from the shop, which were known to run from the shop into the adjacent sugarcane field. Additionally, the State DOH had concerns over their management of chemicals associated with boiler use and maintenance.

In October 2000, Clayton Group Services prepared a Phase I ESA for the entire Grove Farm holding in southeast Kaua'i covering about 22,000 acres. Sections of that report related to the project refer to pertinent land areas as former sugar mill, former herbicide plant, and mud pond area. Discussions of the herbicide mixing area were identified as the area directly east of the sugar mill which includes the areas occupied by Trashco and Wa'alani Enterprises. The study identified some REC, and one significant finding.

4.3.2. Site Reconnaissance

On March 3, April 20, and May 26, 2009, MNA conducted site reconnaissance focusing on identifying *recognized environmental conditions* (REC) at the subject property and surrounding areas with potential impacts to the subject property. This included identifying the presence, or likely presence, of any hazardous substances or petroleum products on the site under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the site or into the ground, ground water, or surface water of the site.

Reconnaissance Findings

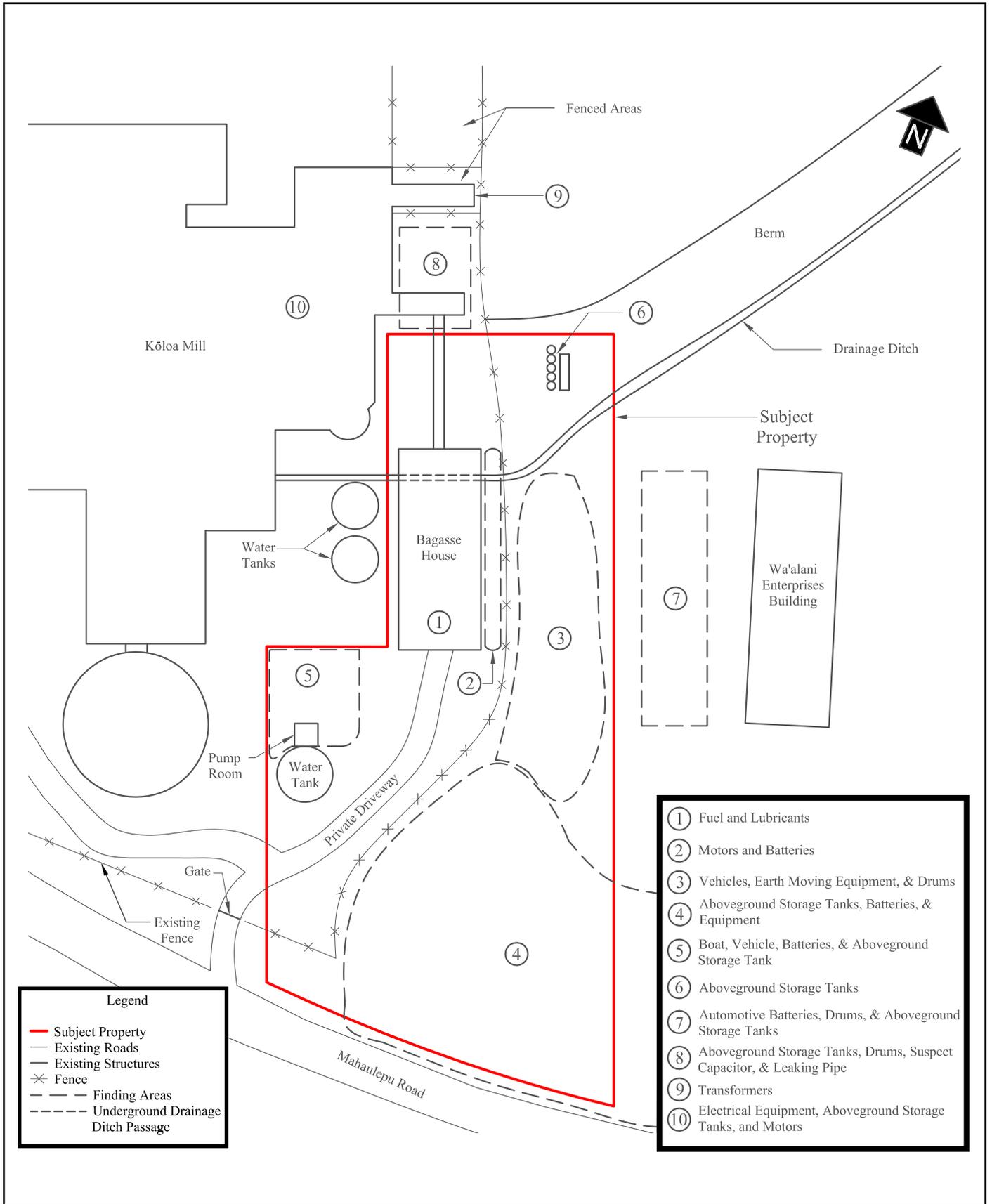
Hazardous materials and petroleum products have been present on the subject property since the construction of the sugar mill in 1913. Significant evidence from the investigation of other sugar mills in Hawai'i showed that hazardous materials and petroleum products were not managed in a manner that prevented their release to the soil and possibly groundwater of the mill sites and select areas of the surrounding agricultural fields (typically pesticide mixing areas). Information collected on this subject property leads to several areas of concern regarding the presence of recognized environmental conditions.

The treatment facility property is composed of two non-contiguous land areas that were identified as Portion A and Portion B. Portion A comprised 1.98 acres and is composed of the bagasse house and surrounding area planned for the facility. Portion B comprised about 2 acres and is composed of a section of the former washwater settling pond planned for use as an infiltration pond for the treatment facility. Figure 4-2 and 4-3 shows Portions A and B, respectively.

With Portion A, Areas 1 through 6 within the site, and 7 through 10 adjacent to this site were identified as having significant findings that could lead to the identification of a REC. An adjacent property to Portion B labeled as Area 11 was identified as having a significant finding that could lead to the identification of a REC. Investigations of these areas during the site reconnaissance resulted in the following determination.

Areas Within Portion A (Treatment Facility Site)

1. Area 1. There is no indication that a release of hazardous materials and petroleum products has occurred from this area or that a material threat of release exists.
2. Area 2. Lead and acid from the batteries located in this area have been released to the environment. Additionally, polychlorinated biphenyls (PCBs) may have been released from the electrical motors discarded in this area.
3. Area 3. Soils staining as well as the active release of petroleum products were observed. Additionally, several drums located in this area were in poor condition, creating a material threat of release.
4. Area 4. Lead and acid from the batteries here have been released to the environment. Additionally, petroleum products and hazardous materials from aboveground storage tanks (ASTs) and stored or discarded equipment may have been released to the environment.
5. Area 5. There is no indication that a release of hazardous materials or petroleum products from the fire suppression pump system located here has occurred or that a material threat of release exists.
6. Area 6. There is no indication that a release of hazardous materials and petroleum products from the AST farm located here has occurred or that a material threat of release exists.



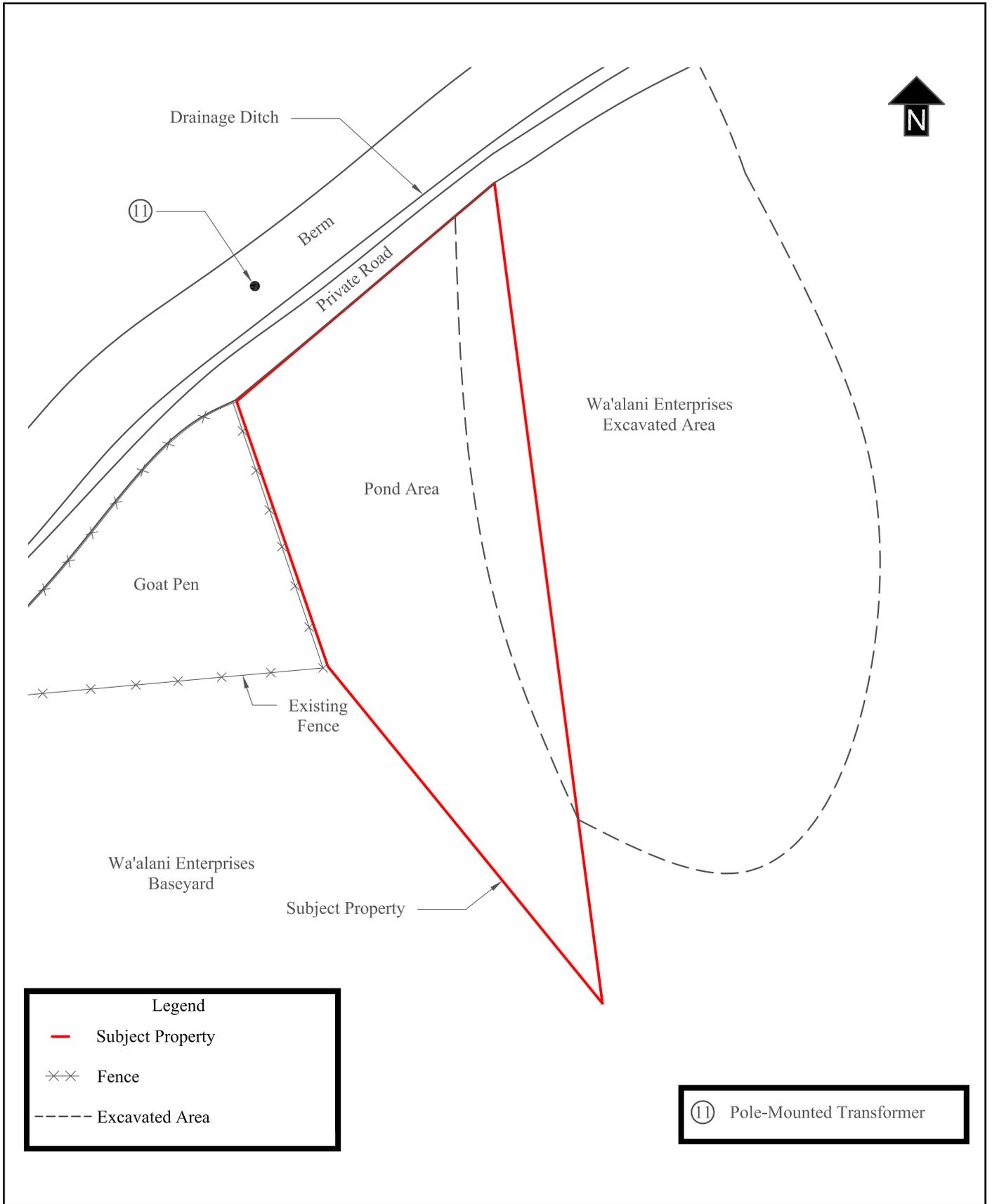
Source:

Phase 1 Environmental Assessment Report

FIGURE 4-2
SITE MAP OF PORTION A FROM PHASE 1 ESA

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC





Source:
Phase 1 Environmental
Assessment Report

FIGURE 4-3
SITE MAP OF PORTION B FROM PHASE 1 ESA

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC



Areas Adjacent to Portion A (Treatment Facility Site)

1. Area 7. Lead and acid from the batteries located here have been released to the environment. Soils staining as well as the active release of petroleum products were also observed in this area. The proximity, topography, and soil type of the area make the migration of pollutants to the subject property a foreseeable possibility.
2. Area 8. Petroleum products and possibly PCBs contained in the drum at the northwest corner of this area have been released to the environment as evidenced by the oil on the top of the drum. Additionally, petroleum products and/or hazardous materials may have been released to the environment from a rusted out drum and AST located in this area. The proximity, topography, and soil type of the area make the migration of pollutants to the subject property a foreseeable possibility.
3. Area 9. There is no indication that a release of hazardous materials or petroleum products from the transformers located here has occurred or that a material threat of release exists.
4. Area 10. Petroleum products from equipment and ASTs in the mill have been released to the environment. Hazardous materials from this area may also have been released.

Areas Within Portion B (Infiltration Basin Site)

1. The likely heavy use of recalcitrant agricultural chemicals and the petroleum product management practices typical of Hawai'i sugar mills may have resulted in the release of hazardous materials or petroleum products to the soil of this site. The sampling and analysis of settling pond soil in an area adjacent to Portion B found the concentration of agricultural chemicals and petroleum product to be below the State DOH 2009 action levels. This soil is believed to be representative of soil in subject property Portion B.
2. Area 11. There is a material threat of the release of a petroleum product and possibly PCBs from the pole-mounted transformer adjacent to subject property Portion B.
3. The 1994 release of 5 gallons of oil in the mill is not likely to impact the subject property.
4. The discharge of automotive wastes, machine fluids and lubricants, or equipment and vehicle wash water on the subject property such that these wastes caused a runoff into and adjacent sugarcane field is likely to have impacted the soil and possibly the groundwater of the subject property.
5. The discrepancy, in the area of the reported wash water settling pond, between the land use observed in the aerial photographs and that described by two interviewees is of note. Additionally, infrastructure supporting the idea that the area was used as a water receiving body of some kind is still present and visible. If the area was not used as a pond in the way described by interviewees, it does not indicate that a release of hazardous materials or petroleum products did occur. Additionally, the

MNA soil assessment report did not find contamination in surface and near surface soils in a portion of this area. This provides evidence that a widespread release of contaminants did not occur in this area.

Soil Testing of Infiltration Basin

In June 2009, an assessment of surface and subsurface soil was conducted in a portion of the mill's washwater settling pond. A portion of this settling pond is planned for use as an infiltration basin for the treatment facility. The assessment looked at the concentration of organochlorine pesticides, chlorinated herbicides, polychlorinated biphenyls (PCBs), arsenic, automotive metals (cadmium, chromium, lead, nickel, and zinc), diesel range hydrocarbons, and motor oil range hydrocarbons in an area of the pond directly adjacent to proposed basin site.

The assessment found that the concentration of all analytes in surface and subsurface soil was either below the analytical reporting limit (non-detect) or below State DOH HEER Office 2009 action levels, with the exception of chromium that exceeded the action level by 25 percent. The assessment concluded that this exceedance could be the result of the background concentration of this metal as opposed to an anthropogenic release to the environment.

4.3.3. Probable Impacts and Mitigation Measures

Investigations of other sugar mills in Hawai'i has showed that hazardous materials and petroleum products may have not been managed in a manner that prevented their release to the soil, possibly groundwater, and select areas of the surrounding agricultural fields (typically pesticide mixing areas). The results of the Phase 1 study conducted for the proposed treatment facility site within the Kōloa Mill has yielded similar findings. Hazardous materials and petroleum products have been present on the subject property since the construction of the sugar mill in 1913, and some areas were identified as recognized environmental conditions.

The operation of the treatment facility at the proposed site is not expected to contribute to additional release of hazardous materials into the soils and surrounding area. The facility would operate in accordance with State and other applicable government regulations and requirements. Such compliance under management and operational procedures would minimize new releases of possible hazardous materials. Furthermore, the project site would need to be cleaned up prior to the construction of planned improvements. Therefore, the project should have minimal impact on the environment associated with hazardous materials.

Mitigative Measures

Based on the findings, a Phase II ESA will need to be done for the project site to address additional soil testing requirements, and then clean-up of the site, as appropriate. Currently, HOH Utilities, LLC is in discussion with Grove Farms regarding establishment of responsibilities for the clean-up of the site as part of their land negotiations.

HOH Utilities, LLC would be responsible under State Hawai'i Occupational Safety and Health (HIOSH) and Federal Occupational Safety and Health Administration (OSHA) regulations for soil contamination, especially from lead or PCBs, best management practices including air monitoring for the particular contaminant(s) as well as installing a dust fence around the construction area and spraying the area with water to keep dust a minimum should be done. During grubbing or grading practices, should waste soil be produced, the soil will need to be properly characterized for disposal. Upon characterization, if hazardous contaminants are detected, the soil will need to be properly packed and shipped to a proper landfill. If PCB contamination is detected, the soil would need to be shipped to the mainland for disposal.

4.4. AGRICULTURAL OPERATIONS

4.4.1. Existing Agricultural Activities

The Kōloa Mill site closed in 1996 when the McBryde Sugar Company phased out of sugar production and closed the mill and operations. Since then, the mill site has been abandoned and unused since that time. Sugar cane production of the surrounding areas has since ceased with the closing of the mill.

Portions of the mill site are presently used for some private industrial related operations. The former bagasse house at this mill site has been used by Jade Construction for the construction of roof trusses. Wa'alani Enterprises is an earth moving and construction company that maintains a base yard in the area surrounding the former scrap metal storage shed situated east of the bagasse house. Their base yard is presently used as is a vehicle, equipment, and drum storage area. These businesses don't involve agricultural related operations or activities.

Surrounding uses in the immediate vicinity of this Kōloa Mill site presently consist of mostly vacant agricultural land formerly used for plantation sugar activities. A privately operated all-terrain vehicle (ATV) commercial operation has a base yard located at the end of Weliweli Road. The agricultural lands located north (mauka) further inland of the Kōloa Mill site appear to be used for these commercial recreational activities. Agricultural fields located south (makai) of the Kōloa Mill site have been used by Pioneer Seed for corn seed production. There are also some small scale agricultural activities occurring further east of the mill site.

At the sites of the proposed wastewater pump stations, there are no existing agricultural activities occurring on the site or in the immediate adjacent area. The routes for the sewer collection system also do not have existing agricultural activities occurring which may be affected.

4.4.2. Probable Impacts and Mitigation Measures

Construction and operation of the proposed regional treatment facility should not impact existing agricultural activities since there are none occurring at this former mill site including the infiltration basin. There are no existing agricultural activities occurring in the immediate vicinity

of this mill site, and there are no known plans for future agricultural use on these areas adjacent to the mill site. Surrounding uses consist of other private businesses which are industrial related along with active recreational use (ATV operation).

The construction and operation of the four wastewater pump stations should similar have no impact on existing agricultural activities. These pump stations would not affect future agricultural activities or operations established in the surrounding area. The pump stations would only involve an area of 0.25 acres or less. Similarly, the sewer collection system lines would not impact existing or future agricultural activities because the lines would be located underground, predominantly within roads (paved, cane haul, etc.), and easements would be established for them.

4.5. VISUAL RESOURCES

The *2000 Kaua'i General Plan* identifies scenic views which are of value to the County through Heritage Resources Maps. The Heritage Resources Maps identify important landforms that have ecological, recreational, cultural and scenic value. Landform typically includes mountains, hills, streams, valleys and gulches, high cliffs and bluffs most of which lie within the State Conservation District. Other resources include viewing points and scenic drives.

The County seeks to preserve scenic resources and public views. Public views are those from a public place, such as a park, highway, or along the shoreline. A general principle used in maintaining scenic resources is to preserve public views that exhibit a high degree of intactness or vividness. "Intactness" refers both to the integrity of visual patterns and the extent to which the landscape is free from structures or other visually encroaching features. "Vividness" relates to the memorability of a view, caused by contrasting landforms which create striking and distinctive patterns.

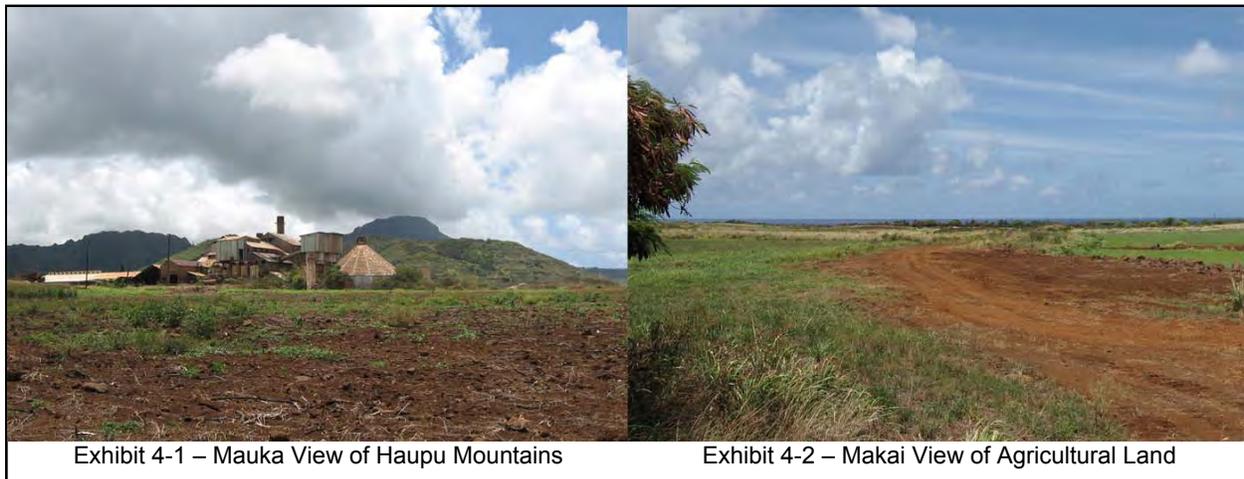
Another principle is to preserve the scenic qualities of mountains, hills and other elevated landforms. The third principle is to preserve the scenic qualities of lowland/open space features, such as the shoreline, the edge of a coastal bluff, a marsh, a fishpond, or a historic or cultural property.

4.5.1. Existing Visual Resources

Of the various project improvements planned under this Regional WRF Project, only the treatment facility would have the potential to impact visual resources. The sewer collection system would be located underground and thus not impact visual resources. Similarly the pump stations would be mainly located underground with the exception of some accessory equipment and not impact visual resources. Therefore, the discussion of existing visual resources and effects are focused on the treatment facility.

The Heritage Resources Map for the Kōloa-Po'ipū-Kalaheo Planning District designates the following scenic roadway corridors in the general area of the treatment facility site: 1) Ala

Kinoiki Road (Po'ipū-Kōloa Bypass Road); 2) Maluhia Road (Highway 520); and 3) Kōloa Road (Highway 530). The Haupu Mountains is identified as an important land form, and Exhibit 4-1 shows a photo from an area makai of the mill site. Puu Hunihuni located makai (seaward) of the mill site where two water tanks are sited is identified as an important land form. There are no natural, historic, or cultural scenic features in the vicinity of this project site. The majority of the area makai of the mill site consists of fallow agricultural land as shown on Exhibit 4-2.



The mauka (inland) viewshed from the treatment facility site is characterized by predominantly open, undeveloped fallow agricultural land with the Haupu Mountains in the background. Makai views are similarly predominantly of undeveloped fallow agricultural land with Puu Hunihuni located to the southeast.

Views of the existing Kōloa Mill site are generally not visible from Kōloa Road and Maluhia Road due to the distance these roadways are from the site and other existing developments present along these roadway corridors. Some views of the mill site from portions of Ala Kinoiki Road are available. Views of the mill are more easily visible from a section of Weliweli Road as one proceeds eastbound approaching the mill site. However, Weliweli Road is not considered a scenic roadway corridor.

4.5.2. Probable Impacts and Mitigation Measures

The treatment facility improvements are expected to have minimal if any impact on views of the scenic landforms of the Haupu Mountains and Puu Hunihuni. Most of the facility equipment would be located within the existing bagasse building and an existing water tank will be used. Other equipment and structures developed at the site would not be large or tall as the remaining mill structures. There are not scenic public viewing areas or lookout points in the vicinity of this project site that would be affected by this project. The surrounding area is privately owned, and not open to the general public for access into these areas.

Views of the scenic landforms from Ala Kinoiki Road would not be impacted by the project because the facilities would not be visible from this roadway. In consideration of the historic character and nature of the existing Kōloa Mill, the design of the building structures associated with the Regional WRF will emulate the architectural characteristics of the Mill to the extent possible.

4.6. INFRASTRUCTURE FACILITIES

This section addresses the project's impact on infrastructure facilities which includes: 1) transportation facilities, 2) water facilities, 3) sewer facilities, 4) drainage facilities, 5) solid waste facilities, and 6) electrical and communication facilities.

4.6.1. Transportation Facilities

4.6.1.1 Existing Roadway Facilities

The major roadways traversing within and in the nearby vicinity of the project area include mainly County roadway facilities. The State DOT's Kaumuali'i Highway is generally routed in an east-west direction providing vehicular access from other regions of the island to this south shore area. County roadway's providing vehicular access in the Kōloa to Po'ipū region include:

1. Maluhia Road (Highway 520) is a two-way, two-lane County road providing mauka-makai access between Kaumuali'i Highway and Kōloa Road.
2. Kōloa Road (Highway 530) is a two-way, two-lane County road providing east-west access between Kaumuali'i Highway to the west and Kōloa Town to the east.
3. Po'ipū Road (Highway 520) is a two-way, two-lane County collector road that is oriented in the mauka-makai direction from Kōloa Road to Lāwa'i Road to the south. This road also runs in an east direction along the coastline up to Ala Kinoiki Road providing access to the various developments.
4. Ala Kinoiki Road is a two-way, two-lane County bypass road that provides mauka-makai access between Maluhia Road and Po'ipū Road near the Po'ipū resort area.
5. The recently constructed Ala Kalanikaumaka Road is a two-way, two-lane County road providing vehicular access from Kōloa Road down to the coastline at Po'ipū Road.
6. Weliweli Road is a two-way, two-lane County road which provides east-west access through Kōloa Town and to the Kōloa Mill site. This road also extends from Ala Kinoiki Road in an eastern direction up to the Po'ipū Bay Golf Course.
7. Waikomo Road is a two-way, two-lane County road that provides north-south access between Kōloa Road and Weliweli Road.

Within the area of the Kōloa Mill, there is a network of unimproved private cane haul roads providing access within this agricultural area along with access to and from the mill site. A private dirt road that runs in an eastern direction from Weliweli Road, along the mill site, and toward other small scale agricultural uses is identified as Mahaulepu Road.

4.6.1.2 Probable Impacts and Mitigation Measures

The collection system improvements, consisting of wastewater pump stations and sewer lines, planned under this Regional WRF Project would not generate additional daily vehicle trips and be a source of long-term traffic impacts associated with the facility's operation. The only impacts associated with these components would be short-term constructed related effects. Thus, the only long-term impacts from the project on traffic conditions would be associated with the operation of the treatment facility at the Kōloa Mill site.

Short-Term Construction Impacts

Short-term construction activities associated with the project may have a minor temporary impact on County roadway facilities. These effects would only involve construction of the sewer collection lines that occur within County roadways. The majority of sewer lines would be within private property along roadways or within the privately-owned agricultural fields. These roadways affected would be Waikomo Road, some portions of Weliweli Road, and a portion of Po'ipū Road near the existing Po'ipū WRF.

Construction of the wastewater pump stations would not affect County roadways because they would be located within privately-owned property. Construction of the regional treatment facility at the Kōloa Mill site would not impact County roadway facilities since this work would occur within privately-owned property.

The minor impacts on County roadways affected would involve temporary additional congestion to traffic resulting from the rerouting of traffic due to construction work or temporary lane closures. Such impacts would inconvenience motorists in the immediate vicinity of the various construction areas. However, the rerouting or temporary lane closures would not occur during the weekday morning and afternoon peak commuter periods where traffic volumes are heavier.

Additional vehicle trips in the area would be generated by construction workers traveling to and from the job sites. These additional trips generated during the weekday morning and afternoon peak commuter periods would only be temporary and have minimal impact on the existing roadway conditions.

A traffic control plan would be developed and coordinated with County agencies for their ministerial review and approval for County roadways affected by construction of the sewer collection lines. The contractor will provide staff to serve as flagmen as needed to direct traffic along County roadways affected by sewer line construction. If necessary, police officers or security personnel may be hired to assist with implementing traffic control in the area during such construction activities. One lane of traffic shall be maintained at all times during construction and all lanes opened to public and pedestrian traffic during non-working hours.

Long-Term Operational Impacts

Operation of the proposed treatment facility would not generate moderate or even significant increases in vehicular traffic to this region. A total of about five employees would be working at this treatment facility when built out. These five employees would thus generate up to five additional vehicle trips during the weekday commuter morning and afternoon peak periods. These additional trips would have minimal if any noticeable effect on traffic conditions along County roadways in the surrounding area.

4.6.2. Water Facilities

4.6.2.1 Existing Water Facilities

Water service in the Kōloa-Po'ipū area is provided by the County of Kaua'i, Department of Water (DOW). The County DOW operates 13 water systems that serve particular geographic areas. Three (3) water systems are located in the greater project vicinity which are Kōloa-Po'ipū, Kalaheo, and Lawa'i-Oma'o. The proposed improvements are located within the Kōloa-Po'ipū Water System service area which consists of a concentration of resorts along the coast, and residential communities clustered near the coast and around Kōloa Town.

The Kōloa-Po'ipū Water System is divided into a 366-foot pressure zone and a 245-foot pressure zone. System sources include five (5) wells with a total capacity of 3,560 gallons per minute (gpm). System storage capacity is 4.25 mg. Kōloa Wells C and D are the sources located nearest the proposed Regional WRF, approximately 0.8 miles to the northeast. Kōloa 16-B Deep Well is also located in the project vicinity, approximately 1.24 miles northwest of the proposed treatment facility site. Various water transmission lines are located throughout the water service area primarily within existing County roadways. A County waterline is routed within an easement through privately-owned property in the area of the proposed Po'ipū Collection System.

4.6.2.2 Probable Impacts and Mitigation Measures

The Regional WRF Project should not result in long-term impacts on the County's water system or their existing transmission system in the Kōloa to Po'ipū region. The treatment facility will collect and treat wastewater to R-1 water quality for disposal. This R-1 quality wastewater is the highest level of treatment and would be used for irrigation of surrounding agricultural lands and reuse as part of the Po'ipū Bay Golf Course. Thus, the project should not affect the County DOW's existing water facilities.

The only area of impact to County water facilities would be short-term construction activities associated with the sewer collection system because portions of it would be within County roadways. Construction of the wastewater pump stations and treatment facility would not impact water facilities because there are none present within the proposed sites. The sewer line planned as part of the Po'ipū Collection System would be routed along an easement route

used by the County DOW. However, the new sewer line would be sited away from the waterline in compliance with County design requirements. Therefore, this sewer line segment should not affect that waterline.

To minimize potential impacts on County waterlines, design plans for the collection system and treatment facility would be submitted to the County DOW for ministerial review as part of the normal design process. Appropriate design requirements and conditions would be complied with by the contractor.

4.6.3. Sewer Facilities

4.6.3.1 Existing Sewer Facilities

The existing private wastewater systems in the Kōloa-Po'ipū area consist of the Po'ipū WRF along Po'ipū Road and several packaged wastewater treatment plants (WWTPs) which serve existing developments in Po'ipū located east of Weliweli Tract. A Kukui'ula treatment facility is also located west of Ala Kalanikaumaka Road.

There are also large capacity cesspools (LCCs) serving the various businesses within Kōloa Town, and individual cesspools and septic tank systems serving individual residences within the Kōloa-Po'ipū area. There are no existing County sewer facilities serving this area. Chapter 2 discussed these private sewer systems in further detail.

The Po'ipū WRF is located on about 2.0 acres of land situated along the mauka side of Po'ipū Road. The Po'ipū WRF is owned by HOH Utilities, LLC and is operated by Aqua Engineers, Inc. The facility currently treats wastewater flows from various resort developments in Po'ipū, as well as the Po'ipū Shopping Village. The Po'ipū WRF has a design capacity of 1.0 mgd, and provides R-1 (tertiary) treatment system of wastewater with filtration and ultraviolet (UV) disinfection systems.

The existing Kukui'ula treatment plant is situated on 26 acres, and is designed to serve the planned community of Kukui'ula. This facility has a design capacity of 1.2 mgd, and treats wastewater to R-2 water quality. The facility presently serves the Paanau Housing development and Kōloa Estates subdivision. A sewer line routed within Ala Kalanikaumaka Road and Po'ipū Road connects this treatment facility to the Po'ipū WRF.

4.6.3.2 Probable Impacts and Mitigation Measures

The Regional WRF Project will not impact County wastewater facilities because there are no facilities presently serving this area.

The project will provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in this south shore area extending from Kōloa Town to Po'ipū. This regional system will also allow for the planned Kukui'ula

development to connect to the proposed collection system for treatment at the Regional WRF. The Regional WRF will treat wastewater at a tertiary level that will result in R-1 quality effluent water that can be reused for beneficial applications. As a result, this project will improve sewer facilities serving this region.

The project will have a beneficial impact by providing existing landowners in Kōloa Town using LCCs the opportunity to connect to the regional system, and thereby resolve wastewater issues and comply with EPA regulations requiring the closures of LCCs. The Regional WRF will also allow new developments planned within Kōloa Town and Po'ipū to connect to the regional system. Existing residences within the proposed service area that are using cesspools or septic tank systems will have the opportunity to connect to this regional wastewater system as well.

The Regional WRF would also allow existing developments that currently operate their own wastewater treatment facilities or packaged WWTPs to connect to the regional wastewater system. This will allow the individual packaged WWTPs to be discontinued and ultimately decommissioned.

Design plans for the collection system and treatment facility would be submitted to both State and County agencies for ministerial review as part of the normal design process. Appropriate design requirements and conditions would be implemented by the contractor.

4.6.4. Drainage Facilities

4.6.4.1 Existing Drainage Facilities

Existing drainage facilities throughout the project area is generally comprised of drainage lines, catch basins, and detention basins which direct surface runoff to streams or drainageways with eventual discharge into the ocean. Factors that affect drainage patterns include area topography and natural and manmade barriers (ex. buildings, etc.) to water flow. Improved drainage systems have been constructed as part of existing urban developments. Most drainage facilities have been constructed within existing roadways.

There are no existing drainage facilities at the Kōloa Mill site and within the surrounding agricultural lands. Drainage conditions predominantly consist of allowing surface runoff to sheet flow following natural drainage patterns for eventual discharge into existing drainageways.

4.6.4.2 Probable Impacts and Mitigation Measures

The Regional WRF project should only have minor impacts on existing drainage facilities and drainage patterns. The sewer collection system would be located underground and thus not affect existing drainage patterns in the area or drainage facilities. The majority of the sewer collection lines would be constructed within undeveloped agricultural areas and along cane haul roads or dirt roads that don't have any improved drainage facilities. Within Kōloa Town, portions of the sewer collection lines would be routed within existing County roadways. However, the

new sewer lines are not expected to impact existing drainage facilities, and design plans would be coordinated with the County for ministerial review and approval.

The four wastewater pump stations would involve an area of 0.25 acres or less, and thus affect only one acre in total. The majority of equipment associated with these stations would be situated underground with the exception of some accessory equipment. Therefore, these pump stations would have minimal impact on existing drainage patterns on the site or in the immediate area. Two of the pump stations are also located in undeveloped areas and one located within an existing packaged treatment facility. The additional increase in impervious area generated by these pump stations would total less than one acre and thereby have minimal effect on drainage patterns and infiltration.

The treatment facility will be utilizing a portion of the existing Kōloa Mill along with existing structures (bagasse building and water tank). Therefore, these improvements should have minimal if any effect on drainage patterns at the mill site or in the surrounding vicinity. There are no existing County drainage facilities at this site which would be impacted. Use of a portion of the present mud ponds formerly used for sugar cane production will similarly have no impact on drainage conditions. The use of a portion of this mud pond for an infiltration basin retains the existing use of this site.

During design and construction of the proposed wastewater system improvements, coordination will be conducted with the County Department of Public Works and the respective landowners to ensure that the functions of the existing area drainage improvements are not impacted or impeded. This will include the submittal of design plans for proposed improvements to the County for ministerial review and approval. The contractor will implement necessary conditions and agency requirements.

4.6.5. Solid Waste Facilities

4.6.5.1 Existing Solid Waste Facilities

The County DPW maintains an Island-wide solid waste collection and disposal system. The existing Kekaha Landfill is the primary disposal site for solid waste on the Island. The County is currently seeking a lateral expansion of the Kekaha Landfill which could extend its capacity by about 12 years, and is also seeking another landfill site as part of its long-term planning objectives. Refuse transfer stations are located throughout the island for residents.

4.6.5.2 Probable Impacts and Mitigation Measures

Construction of the project will generate solid waste typical of normal construction related activities over a short time period. Generated wastes will consist primarily of vegetation, rocks, and other debris resulting from the clearing and grubbing of the site. The contractor will be required to remove all debris from the site, and properly dispose them at the landfill in conformance with County regulations. Such activities are expected to have a minor impact on

County solid waste facilities. If necessary, a trash management and recycling program will be developed and implemented during construction activities to minimize impacts to the Kekaha Landfill.

Operation of the proposed Regional WRF will produce solid waste as a byproduct of the wastewater treatment and reclamation process. The wastewater reclamation process will remove and treat liquids from effluent to R-1 quality standards for reuse in non-potable applications. However, the remaining solids will be disposed of at the Kekaha Landfill. The disposal of solids should not significantly impact the County's landfill, and the disposal of these solids will be in compliance with pertinent State and County regulations.

4.6.6. Electrical and Communication Facilities

4.6.6.1 Existing Electrical and Communication Facilities

Electrical service in the Project vicinity is provided by Kaua'i Island Utility Cooperative (KIUC). Telephone service in the Project vicinity is provided by Hawaiian Telcom. Oceanic Time Warner Cable of Hawai'i is the local CATV provider in the region.

There are no telephone or cable television services presently being provided at the Kōloa Mill project site. Electrical service is presently being provided to this mill site and used by other commercial operators in the area. Utility services by these companies are provided via an existing network of predominantly overhead electrical and communications lines in the area.

4.6.6.2 Probable Impacts and Mitigation Measures

The Regional WRF project should have minimal impact on existing electrical, communication, and cable TV providers or their infrastructure facilities. The sewer collection lines will not require services from these utility companies, and design plans will be coordinated with them for review to ensure the sewer lines do not impact their facilities.

The pump stations would only require electrical service and the additional demand generated should be minimal. Design plans would be coordinated with KIUC to ensure the availability of electrical service prior to operation. Similarly, the regional treatment facility will require electrical service from KIUC and communication service from Hawaiian Telcom. Coordination of design plans will be conducted with these companies to ensure the availability of electrical and communication service prior to operation.

Prior to construction of the proposed wastewater system improvements, the construction contractor(s) will also be responsible for verifying the location and depth of all existing electrical utilities within the affected areas to ensure that functions of the utilities are not impacted or impeded. Energy-efficient measures to reduce the maximum electrical demand will be considered where feasible in the design and operation of the proposed Regional WRF and pump stations.

4.7. PUBLIC FACILITIES

This section addresses the project's impact on public facilities which includes: 1) educational facilities, 2) parks and recreational facilities, 3) medical facilities, and 4) police and fire protection.

4.7.1. Educational Facilities

4.7.1.1 Existing Educational Facilities

Kōloa Elementary School is part of the State Department of Education's (DOE) Kaua'i complex which is made up of three elementary schools and one middle school which feed into Kaua'i High School. There is one charter school in this complex. Kōloa Elementary School is the only State DOE school situated in the Kōloa area with the other schools situated within Līhu'e. This school is located on the western side of Po'ipū Road about 0.25 miles south of this road's intersection with Kōloa Road. Figure 4-4 shows the location of this school.

Kōloa Elementary School serves students living in the Kōloa, Lawa'i, Oma'o and Po'ipū areas. It provides public education to students from Kindergarten to Fifth grade, and has a preschool program. Most students live within walking distance and school buses provide transportation for students who live in the rural areas of Lawa'i and Oma'o. Enrollment has slightly increased from 175 to 183 students in 2006 and the school had approximately 16 teachers in 2006. According to State standards, the school was rated adequate in regards to classroom space.

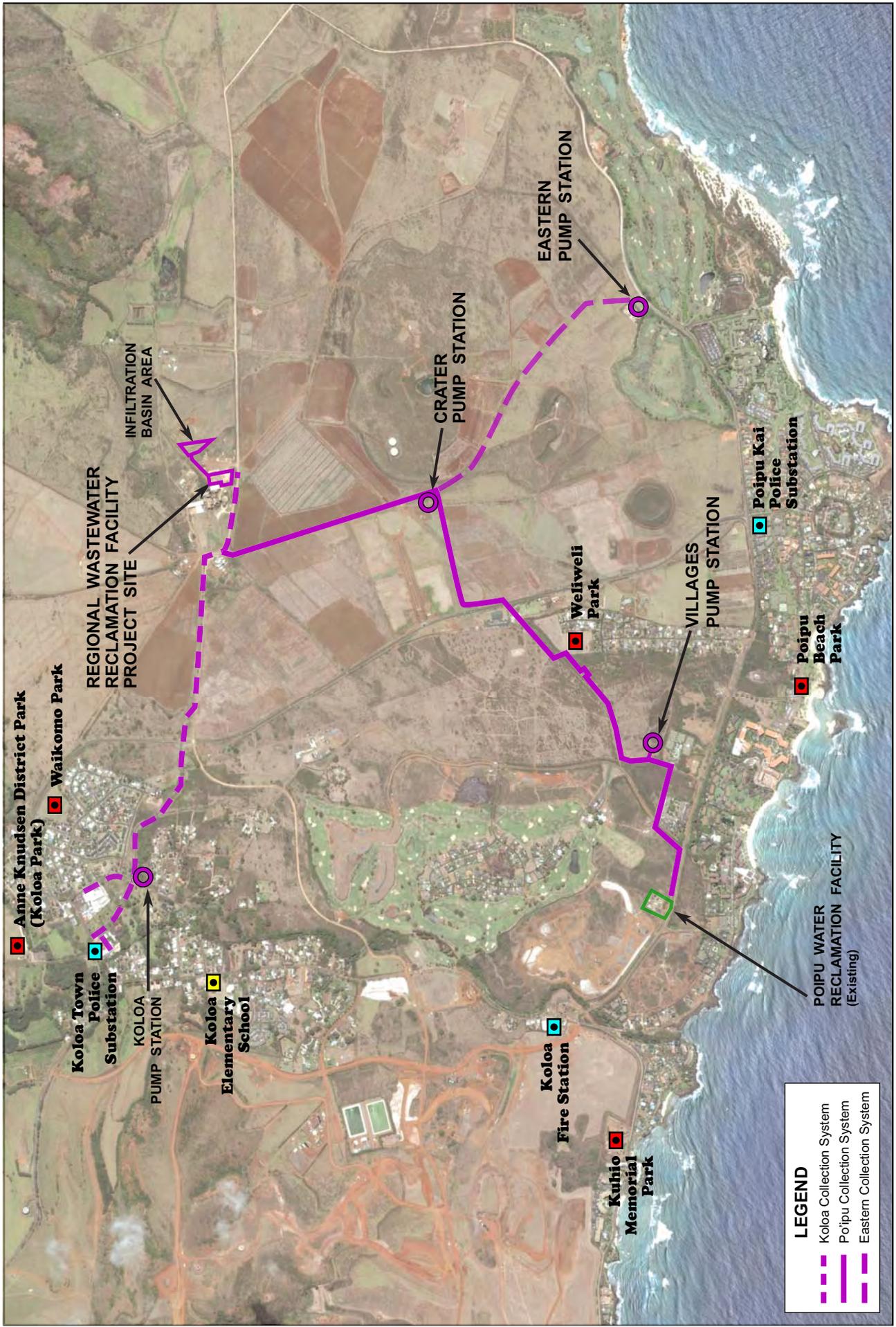
This school site is located over one mile away from the site of the proposed treatment plant at the Kōloa Mill. There are no sewer collection improvements occurring within Po'ipū Road that is routed adjacent to the school. Portions of the Kōloa Collection system improvements would occur in the general area of this school about 0.25 miles away.

4.7.1.2 Probable Impacts and Mitigation Measures

Proposed improvements should not have any long-term impact on existing school facilities, activities, or operations conducted there. This project would not result in direct or indirect changes to current and future enrollment projections for the school and as a result, the existing teacher and administrative staffing requirements for the school would not be affected.

Impacts to this school would mostly be associated with short-term construction-related activities. The treatment facility site is located over one mile away from this school therefore construction of this facility should not have any impacts on the school. Of the sewer collection system improvements, the only portion in the general vicinity of the school is a segment of the Kōloa Collection System. This involves sewer lines routed within or along Weliweli Road and

FIGURE 4-4
PUBLIC FACILITIES LOCATION MAP
KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utrifiles, LLC



Source:
Digital Globe (Aerial Map - May 2007)
Aqua Engineers, Inc. (Regional Facility System)

Waikomo Road about 0.25 miles away. Nuisance effects on the school from construction activities should be minimal due to the distance away from the school, and the presence of several other urban developments in between which includes businesses and residences.

Noise and dust emissions would likely constitute the primary impacts associated with the construction activities. In order to mitigate these impacts, the contractor would be required to comply with applicable regulations and permit conditions governing construction activities to minimize disruptions on surrounding areas. Best management practices (BMPs) would be implemented to minimize dust, erosion and other impacts from construction-related activities in accordance to permit requirements and State DOH regulations.

4.7.2. Parks and Recreational Facilities

4.7.2.1 Existing Recreational Facilities

The County has several parks located in this Kōloa to Po'ipū region which vary from neighborhood parks to shoreline parks. There are no State parks located in this general area. There are two (2) private golf courses which are the Kiahuna Golf club located east of Po'ipū Road, and the Po'ipū Bay Golf Course located along the coastline on the eastern end of Po'ipū resort area. Figure 4-4 shows the general locations of these recreational facilities. A summary of the existing County park sites in the general area is provided.

1. Anne Knudsen District Park (also referred to as Kōloa Park). This is a district park of 11.28 acres located along Maluhia Road north (mauka) of the commercial area of Kōloa Town. This District Park has several facilities supporting active recreational activities which include a pavilion, comfort stations, little league and baseball fields, lighted softball field, tennis court and basketball court, and playground equipment.
2. Waikomo Park. This is a neighborhood park of 3.74 acres located along Ala Kinoiki Road on the eastern end of Kōloa Town. This large grassed park mainly serves as a soccer field for activities and has a comfort station.
3. Weliweli Park. This is a neighborhood park of 9.00 acres located at the northern (mauka) end of a residential subdivision along Kipuka Street. This subdivision is located in the Po'ipū resort area mauka of Po'ipū Road. This grassed park has a basketball court, open field, and comfort station.
4. Po'ipū Beach Park. This is a County beach park of 5.44 acres running along the shoreline in the Po'ipū resort area. This beach park has pavilions, comfort stations, picnic facilities, all terrain wheel chair, and has life guards on duty.

There are several other beach parks along the coastline running from the Po'ipū resort area westbound to Kukui'ula such as Brennecke Beach located east of Po'ipū Beach Park.

4.7.2.2 Probable Impacts and Mitigation Measures

Project improvements should not have any long-term impact on existing recreational facilities in the general project area or the activities occurring there. This project would not directly cause any changes to current and future resident and visitor populations in the region, and would thus not create additional demands or impacts on these facilities.

Any impacts to recreational facilities would be associated with short-term construction-related activities. The nearest County park site to the planned treatment facility site at Kōloa Mill is Waikomo Park located about one mile away. Therefore, construction of this facility should not have any impacts on this or other park sites.

The Kōloa Collection System improvements would occur within the Kōloa Town area. However, both the Anne Knudsen District Park and Waikomo Park are located about 0.25 miles or greater away from the sewer construction area within or along Weliweli Road and Waikomo Road. Nuisance effects from the temporary construction activities should be minimal due to the distance away, and the presence of other urban developments in between which includes businesses and residences.

The Po'ipū Collection System improvements would include a sewer line running near Weliweli Park. This sewer line would not enter into the County's park site. Nuisance effects from the temporary construction activities should be minor as only a short segment would run near the park site. As construction of the sewer line moves further away from this park, the temporary construction nuisance effects would decrease. Other County park sites and beach parks should not be affected since the sewer line construction would be temporary and a distance away.

Construction work would also occur during weekdays during normal business hours when use of these park sites is generally lower especially during the school year. Noise and dust emissions would likely constitute the primary impacts associated with the construction activities. In order to mitigate these impacts, the contractor would be required to comply with applicable regulations and permit conditions governing construction activities to minimize disruptions on surrounding areas. Best management practices (BMPs) would be implemented to minimize dust, erosion and other impacts from construction-related activities in accordance to permit requirements and State DOH regulations.

4.7.3. Medical Facilities

4.7.3.1 Existing Medical Facilities

The closest hospital to the project area is Wilcox Memorial Hospital located in Lihue which provides 71 acute care beds and emergency rooms services. The only medical facility present within the Kōloa district is the Kōloa Clinic located on Kōloa Road in Kōloa, approximately 600

feet from the Kōloa collection System. The Kōloa Clinic is a satellite clinic operated by Wilcox Health System's Kaua'i Medical Clinic and provides family practice medicine in this district.

As a whole, Kaua'i Medical Clinic has 72 physicians and mid-level providers offering 22 medical specialties. Emergency medical service in the Project area is provided by American Medical Response, a private ambulance service contracted by the County, located on Po'ipū Road, across from the Kōloa Fire Station.

4.7.3.2 Probable Impacts and Mitigation Measures

Improvements associated with this Regional WRF project should not have any long-term impact on existing medical facility (Kōloa Clinic) in the Kōloa district or the activities occurring there. This project would not directly cause any changes to current and future resident and visitor populations in the region, and would thus not create additional demands or impacts on this clinic.

Any impacts to this facility would be associated with short-term construction-related activities. Noise and dust emissions would likely constitute the primary impacts associated with the construction activities. In order to mitigate these impacts, the contractor would be required to comply with the applicable regulations and permit conditions governing construction activities to minimize disruptions on surrounding areas. Best management practices (BMPs) would be implemented to minimize dust, erosion and other impacts from construction-related activities in accordance to permit requirements and State DOH regulations.

4.7.4. Police and Fire Protection

4.7.4.1 Police Protection

The Kaua'i Police Department has three district stations located approximately 25 miles apart. The project area is located within Police Sector 7 of the Waimea District. The Waimea Police Substation is located in the Waimea district of the island along Kaumuali'i Highway at the intersection with Menehune Road. The Waimea District covers the towns of Kekaha, Waimea, Hanapepe, Ele'ele, Kalaheo, Lawa'i, Oma'ō, Kōloa, Po'ipū, and everything in between. Within the Kōloa Town and Po'ipū area, the County has two (2) mini police substations. One is located in Po'ipū Kai near the Pe'e Road with Po'ipū Road intersection, and the other located in Kōloa Town.

Probable Impacts and Mitigation Measures

The Regional WRF project improvements should not have any long-term impact on the County police department's ability to provide protection services to area residents and visitors. This project would not directly cause any changes to current and future resident and visitor populations in the region, and would thus not create additional demands or impacts on this department's operations or activities. The regional collection system would consist of

underground sewer lines and four pump stations that would not affect the department's operations. The operation of the treatment facility should similarly not affect the department's operation.

Short-term construction activities associated with the project may require temporary lane closures to some County roadways depending upon the construction methods implemented by the contractor. Police officers may be hired to assist with implanting traffic control in the area during such construction activities if not conducted by the contractor. However, these added services should not negatively impact the Department's operations.

4.7.4.2 Fire Protection

The Kaua'i Fire Department has a main station and administrative headquarters in Lihue. Other fire stations are located in Waimea, Hanapepe, Kalaheo, Kōloa, Kapa'a, and Hanalei. The county has a unified, island-wide system of fire protection and rescue services. The closest fire station to the project area is the County's Kōloa Fire Station that is located at the intersection of Po'ipū and Lawa'i Road. The initial backup unit to the Kōloa Fire Station will be provided by the Kalaheo Fire Station, with the second backup response unit from the Lihue Fire Station.

Probable Impacts and Mitigation Measures

The Regional WRF project improvements should not have any long-term impact on the County fire department's ability to provide protection services to area residents and visitors. This project would not directly cause any changes to current and future resident and visitor populations in the region, and would thus not create additional demands or impacts on this department's operations or activities. The regional collection system would consist of underground sewer lines and four pump stations that would not affect the department's operations or likely require fire services.

The operation of the treatment facility should similarly not affect the department's operation. The facility will be designed in conformance to applicable building and fire code requirements. Appropriate design plans will be coordinated with the department for their ministerial review during the project's design phase.

4.8. SOCIAL AND ECONOMIC FACTORS

This section discusses the project's probable impact on economic and fiscal factors associated with the State and County, as well as social factors such as changes in resident population, housing, and character of the community.

4.8.1. Existing Social and Economic Context

4.8.1.1 Existing Character of Kōloa-Po'ipū Area

The Kōloa, Po'ipū, and Kukui'ula project areas on the south shore of the island are part of the County's Kōloa-Po'ipū-Kalāheo Planning District under their *2000 Kōloa-Po'ipū-Kalāheo General Plan*. This region is the County's largest resort destination and has some of the most active agricultural businesses. Hotels and resort condominiums are centered along beaches and golf courses of Po'ipū and the growing Kiahuna community. Visitors are drawn to bicycling and ocean recreation activities, as well as other attractions in the historic towns.

Large and small-scale agricultural activities are generally located in the irrigated agricultural and coastal lands below (makai) Kaunualii Highway. Corporate agriculture operations, such as the coffee plantations and a seed corn facility, have been operating in the areas west of Kukui'ula and southeast of Kōloa Town. Smaller farms and private agricultural parks occupy leased lands throughout this region. Cattle and other livestock have been raised on pasturelands outside the project area around Lāwa'i and Kalāheo, as well as on lands further mauka (County, November 2000).

Kōloa Town

Kōloa's history is preserved through the plantation and western architecture present in the town core, its historic churches, and other historic buildings. In the town center, renovations and new buildings similarly follow the style of "Old Kōloa Town." Shaded by building canopies and large trees, pedestrian walkways connect "pockets" of public parking at each end of town. Today, Kōloa Town is primarily a residential community with a small but vibrant downtown core that serves the needs of local residents and visitors alike.

The town provides Kōloa and Po'ipū residents with various services such as grocery stores, the Post Office, and the Neighborhood Center. Both visitors and residents are also attracted to this town because of its unique shops, restaurants and taverns. East of the town center, the historic Kōloa Sugar Mill is in active use as a light industrial center. Coffee, papaya, taro, and other export crops are being grown on former sugar lands in the immediate area and to the west (County, November 2000).

Po'ipū Resort Area

Po'ipū is predominantly a beach resort that accommodates both a residential community and the island's largest visitor destination area. The formerly sleepy seaside village of Po'ipū Beach is today a major resort community with major hotel and resort complexes by the Sheraton, Marriott, Hyatt, and others. There are numerous smaller condos, timeshares, and other vacation rental and fractional-ownership properties. This community is home to about 40 percent of Kauai's resort accommodations and is a major center of employment.

Po'ipū is known for its many outdoor recreation opportunities which are generated by its beaches, surf breaks, diving spots, golf courses, and tennis facilities. The number of visitor units has grown moderately since the year 2000, with condominium projects being added mauka of Po'ipū Road. Bicycle tours use old agricultural roads, and walkers, joggers and bicyclists enjoy the continuous pedestrian/bicycle pathway that runs along the shoreline from the Spouting Horn to Mahaulepu (County, November 2000).

Kukui'ula Community

The future community of Kukui'ula is being developed under a community master plan that calls for a mix of resort units and residential neighborhoods built around a golf course and wetland/lagoon. New urban development is focused in this region while retaining other productive agricultural lands in cultivation. The planned roadway system within Kukui'ula would provide an alternative route for traveling west to Kalāheo and Port Allen. The recent opening of Ala Kalanikaumaka Road provides another mauka-makai road for residents and visitors traveling between Kōloa and Po'ipū.

Other Communities Outside Project Area

Ōma'ō and Lāwa'i are small rural residential communities located northwest (mauka) of Kōloa Town. Pasturelands, hills and stream valleys give variety to the landscape, and creates separation between settlements preventing the appearance of sprawl. A small commercial area around the old Lāwa'i Cannery is developed with shops and services serving nearby residential neighborhoods as well as people traveling along Kaumuali'i Highway or Kōloa Road.

In Kalāheo, numerous homes dot the hillsides mauka of town and around Kukuilono Park. The population of the Kalāheo is growing as homestead and agricultural subdivisions created in the 1970's and '80s are being built out with homes. In the town center, business properties are gradually being renovated with building designs supporting the paniolo theme. Businesses have expanded mauka and makai of Kaumuali'i Highway along the larger intersections.

4.8.1.2 Population and Housing

The Kōloa-Po'ipū project area is located within the Po'ipū Census Tract (CT 406). Demographic and other information was reviewed from the 2000 Census for Kōloa Town and Po'ipū, and the combined socio-economic data from the region is shown on Table 4-3.

Based upon the data shown on the table, this Kōloa-Po'ipū region generally has a slightly older population the island of Kaua'i. The median age of the population was 40.6 versus 38.4 years old for the island. This region also has a slightly greater percentage of population 65 years and older than the County contributing to the older median age.

By racial mix, there is a greater percentage of Whites (37.1%) here than island-wide (29.5%). This region has slightly less Asians (33.3%) and those with two or more races (22.2%) than island-wide (36.0% and 23.8%, respectively). These three races make up the majority of the population. Native Hawaiian and other Pacific Islanders in this region were also lower than island-wide with 5.7 percent versus 9.1 percent, respectively.

Households

The data included on the Table also suggests that this region is comprised largely of vacation homes owned or rented by older, non-native individuals or couples. Households in the project area have a smaller average size, but slightly higher married-couple families, and more non-family householders than Kaua'i. There are substantially more vacant units in this area than Kaua'i with a 45.1 percent seasonal vacancy rate. Other household information in the project area is generally similar to the island data.

According to the 2000 Census, the median family income for the project area was \$54,779, which is greater than the median household income for Kaua'i which was \$51,378. Similarly, the median household income in the project area was higher than island-wide.

Future Development

As noted in the Census demographic profile above, there are about 3,600 existing housing units in the Kōloa-Po'ipū area. This number is proposed to double with the addition of approximately 3,700 units from currently planned and proposed developments based upon information from a *Kōloa-Po'ipū Area Circulation Plan* (Charlier, April 2007). Based upon information from this area circulation plan, 1,669 single-family residences and 2,083 condominium or multi-family units are planned. In addition, about 325,000 square feet of new commercial space was anticipated.

Table 4-3 Demographic Characteristics Comparison of Kōloa-Po'ipū with Kaua'i: 2000				
Subject	Kōloa and Po'ipū CDP Combined		Kaua'i	
	Number	Percent	Number	Percent
Total Population		100	58,463	100
AGE				
Under 5 Years	313	5.8	3,605	6.2
5 – 19 years	1,107	20.4	13,147	22.5
20 – 64 years	3,112	57.6	33,642	57.5
65 years and over	878	16.2	8,069	13.8
Median age (years)	40.6	--	38.4	--

Table 4-3 Demographic Characteristics Comparison of Kōloa-Po'ipū with Kaua'i: 2000				
Subject	Kōloa and Po'ipū CDP Combined		Kaua'i	
	Number	Percent	Number	Percent
Total Population		100	58,463	100
RACE				
White	2,005	37.1	17,255	29.5
Black or African American	12	0.2	177	0.3
American Indian and Alaska Native	22	0.4	212	0.4
Asian	1,799	33.3	21,042	36.0
Native Hawaiian and other Pacific Islander	306	5.7	5,334	9.1
Two or more races	1,201	22.2	13,938	23.8
Other	59	1.1	505	0.9
HOUSEHOLD (BY TYPE)				
Total Households	1,973	100	20,183	100
Family households (families)	1,424	72.2	14,572	72.2
Married-couple family	1,084	55.0	10,881	53.9
With own children under 18 years	436	22.1	4,842	24.0
Female householder, no husband present	233	13.4	2,582	12.8
With own children under 18 years	129	11.8	1,424	7.1
Nonfamily households	125	6.3	5,611	27.8
Average household size	2.71	--	2.87	--
HOUSING OCCUPANCY AND TENURE				
Total Housing Units	3,591	100	25,331	100
Occupied units	1,973	54.9	20,183	79.7
By owner	1,138	57.7	12,384	61.4
By renter	835	42.3	7,799	38.6
Vacant units	1,618	45.1	5,148	20.3
SOCIAL CHARACTERISTICS				
Population 25 years and over	3,705	100	38,872	100
High school graduate or higher	3,118	84.2	32,368	83.3
Bachelor's degree or higher	764	20.6	7,551	19.4
ECONOMIC CHARACTERISTICS				
In labor force (pop. 16 & over)	2,731	63.6	28,355	63.1
Median household income (dollars)	48,053	--	45,020	--
Median family income (dollars)	54,779	--	51,378	--
Per capita income (dollars)	22,782	--	20,301	--
<i>Source: U.S. Census Bureau, Census 2000 Summary</i>				

These developments would be developed over several years subject to economic conditions. Therefore, the Kōloa-Po'ipū area will have changes occurring over the next decade or longer as these projects slowly move forward adding addition housing units and populations to the area.

4.8.1.3 Economy

The County of Kaua'i, Office of Economic Development published a study entitled Kaua'i Economic Outlook, prepared by the University of Hawai'i, Economic Research Organization in July 2008. The study analyzed economic conditions for Kaua'i through 2009. According to the study, while Kaua'i shared in the State's economic growth in 2007, the rate of deceleration was less obvious than in other counties. The visitor industry continued to expand at a healthy rate, construction was buoyant, and business confidence remained relatively high.

In 2007, where total visitors to the State declined, Kaua'i led the counties in visitor arrivals growth. Visitor days rose 4 percent in 2007, compared with declines of 1.0 – 2.1 percent in the other counties, and Kaua'i's total visitor spending growth led the State at 4.5 percent.

According to the study, the Kaua'i visitor inventory had a higher share of timeshare and condo units, and independent vacation rentals than any other market in the State. In recent years, the timeshare sector on Kaua'i has been stable, but this will increase when units now under construction are completed and become available. On the east side of the island, currently there is the Kaua'i Lagoons development in Līhu'e, Waipouli Beach Resort Condos in Kapa'a, and Kealanani agricultural subdivision north of Kapa'a.

The real estate market on Kaua'i has slowed down in transaction volume, and had a moderate decline in prices that became evident in 2005. Between 1995 to 2005, single family resale volume had grown 435 percent, and median home prices had risen 280 percent by 2006. The median Kaua'i single family home price of \$578,500 in the fourth quarter of 2007 was down more than 20 percent from their third quarter 2006 peak. The County also continues to add to the affordable housing pool with projects such as the Courtyards at Waipouli and another at Haa Street in Līhu'e.

Several key events which occurred recently have affected growth in 2008 to 2009. These include the exit of two inter-island cruise ships, the closure of ATA and Aloha Airlines, the increase of oil prices, and the slump in the housing market nationwide.

4.8.2. Economic and Fiscal Impacts

This section discusses both the short and long-term effects of the project on both the County and State's economic and fiscal factors. Development of the project will have different impacts in relation to Kaua'i County and the State of Hawai'i. Construction of this regional infrastructure improvement will have a moderate positive economic impact mainly associated with the creation of short-term construction related jobs. As the treatment plant and sewer collection system are constructed, there would be a few permanent long-term jobs generated by this project.

4.8.2.1 Short-Term Constructed Related Effects

Construction of the Regional WRF Project should have a positive economic impact associated with the creation of short-term construction related jobs. The preliminary estimated construction costs for the project were projected to be approximately \$28.0 million. However, construction costs would vary depending upon final design plans and phasing given funding availability. Depending on the phasing implemented for the treatment plant and sewer collection improvements, construction jobs would be spread over several years. The project's construction would create the following types of jobs and income.

- Direct jobs are immediately involved with construction of a project or with its operations.
- Indirect jobs are created as businesses directly involved with a project purchase goods and services in the local economy.
- Induced jobs are created as workers spend their income for goods and services.

Direct construction jobs would typically consist of on-site laborers, tradesmen, mechanical operators, supervisors, etc. These new jobs created would also generate additional personal income for construction workers. Personal income is defined as the wages paid to the direct construction workers or operational employees associated with a development.

Direct economic benefits will result from construction expenditures both through the purchase of material from local suppliers and through the employment of local labor, thereby stimulating that sector of the economy. It is anticipated that these construction jobs would likely be filled by residents from the Island of Kaua'i employed within the construction industry. Direct construction jobs created would also stimulate indirect and induced employment within other industries on the island such as retail, restaurants, material distributors, and other related businesses supporting the construction industry.

Based upon the construction budget, it was estimated that the project would create a total of about 225 jobs over the entire construction period. These jobs would be created based upon the phasing of the project implemented which will be dependent upon future wastewater demands tied to future development in the Kōloa to Po'ipū area. Assuming a five year construction period, this would generate about 45 direct construction jobs a year.

This would generate a total of another approximately 290 indirect and induced jobs over the entire construction period or about 60 jobs annually. Thus, a total employment impact of about 105 jobs annually (direct, indirect, induced) would be generated by this project, or approximately 515 total over the entire construction period.

These new direct construction jobs would generate additional personal income for construction workers totaling approximately \$2.0 million per year or \$10.0 million over the entire

project. Indirect and induced income would also be generated on the order of \$1.8 million a year, or \$8.9 million over the entire project.

4.8.2.2 Fiscal Impacts on State and County

State Revenues and Expenditures

Fiscal impacts to the State of Hawai'i associated with this project would predominantly be associated with short-term construction activities. The State would not need, and is not expected, to add personnel to their existing departments or construct new government facilities due to the construction and operation of the privately-owned Regional WRF and associated sewer collection system. Therefore, the short-term effects on the State would primarily involve some additional tax revenue generated to the State.

Tax revenue sources for State government from construction activities are composed primarily of general excise taxes (GET) on development costs and construction materials, along with corporate income tax, and personal income tax from construction workers. Construction related tax revenues would be one-time or short-term increases in revenue occurring during the construction phase. The \$28.0 million construction budget projected by the Applicant for construction of this regional wastewater project would therefore generate a minor positive increase in tax revenue to the State. Based upon the construction budget, it was estimate that this project would generate about \$2.33 million in total tax revenue to the State.

Changes to State revenues from the operational employment created by the project would be associated with new full-time and part-time jobs created to operate and maintain the new regional treatment facility. Operation of this facility is expected to be filled mainly by residents within the County. A total of five (5) additional jobs may be created to operate this facility. Therefore, this project would have a positive impact in generating new permanent jobs, however, the overall effect to the State would be minimal.

State revenue generated from new operational jobs would include additional income tax and excise tax from the spending of this income. Thus, the operations related income generated to the State by the project was estimated to be about \$250,000 annually.

County Revenues and Expenditures

County revenues are primarily limited to tax revenues on privately-owned property and improvements. The treatment facility site is part of two large agricultural properties generating about \$62,400 in annual tax revenue based upon recent 2009 County data. This present property tax revenue is small in relation to the County's annual property tax revenue.

With development of the Regional WRF at the Kōloa Mill site, the project site may contribute to the overall two larger properties being appraised at a slightly higher rate due to the improvements. However, the treatment facility site only involves about 2 acres in size and is not

expected to significantly change annual property tax revenue. Nevertheless, the project will contribute to increased property tax revenue to the County having a minor positive impact.

This project is not expected to generate any new in-migrant residents to the Island of Kaua'i to fill permanent operational jobs associated with the treatment facility. The County would not require additional staffing to continue providing public services serving this community and surrounding areas. Therefore, the project would have minimal, if any, impact on the County's fiscal expenditures.

4.8.3. Social Impact Factors

This project is not expected to generate any new in-migrant residents to the Island of Kaua'i to fill short-term construction related jobs or permanent operational jobs at the treatment facility. Improvements planned would not involve the acquisition of private property or homes. Easements would be obtained for collection system improvements within County roadways and privately-owned property. Therefore, this wastewater project would not affect the future population growth trends projected for this region. Because the project would not affect projected resident population growth in this region, it would similarly not affect planned housing units.

The proposed improvements would not result in a disproportionately high impact on minority populations or low-income populations in the project area. This includes short-term construction related effects, long-term, and cumulative effects as discussed in various sections of this document.

The project is not expected to significantly impact the existing character of Kōloa Town, the Po'ipū resort area, Kukui'ula's planned community, or the area surrounding the Kōloa Mill. The regional treatment facility and collection system should have minimal, if any, effect on future development patterns in the region along with the planned number of housing units and population. Developments planned in the region are based upon other market and economic factors of which connection to the sewer collection system would be a minor component of those factors.

Future development in this region would be dictated by the County of Kaua'i via their land use policies and entitlements process. The County's entitlement process and regulations, such as their zoning ordinance, would regulate specific land uses for various parcels. Thus, decisions and approvals given for future developments are controlled by the County of Kaua'i through this process.

5. RELATIONSHIP TO LAND USE, POLICIES AND CONTROLS

This section discusses State and County of Kaua'i land use plans, policies, and controls relating to the proposed Project. Those plans and policies pertinent to this project are addressed.

5.1. HAWAII STATE PLAN

The Hawai'i State Plan, Chapter 226, HRS, serves as a guide for goals, objectives, policies, and priorities for the State. The Hawai'i State Plan provides a basis for determining priorities, allocating limited resources, and improving coordination of State and County plans, policies, programs, projects, and regulatory activities. It establishes a set of themes, goals, objectives and policies that are meant to guide the State's long-range growth and development activities. The Project is consistent with the following applicable objectives and policies:

Section 226-11 Objectives and policies for the physical environment – land based, shoreline, and marine resources.

(b)(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

(b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(b)(8) Pursue compatible relationships among activities, facilities, and natural resources.

The purpose for the Regional WRF Project is to provide improved sewer collection and treatment services for residents and businesses in the Kōloa-Po'ipū-Kukui'ula region of this south shore. Therefore, the project will allow LCCs, cesspools, and individual WWTPs to close and connect to this regional system. This service would reduce present effects on groundwater and coastal water resources associated with current sewer treatment and disposal practices in this region. In doing so, the project will improve the compatibility between land based activities and their effects on natural resources and ecological systems.

The project was planned based upon engineering requirements needed for the treatment facility and collection system, and took into account the physical attributes of the areas affected. As a result, the project will include the adaptive reuse of some structures from the Kōloa Mill. Collection system routes were planned to minimize effects on natural resources, including historic sites, and thus presently involve existing roadways, cane haul roads, or existing utility easements. Coordination with landowners affected was also conducted by the Applicant in planning these system routes. Pertinent mitigative measures would be implemented to further minimize effects on the environment as discussed in this document. All these project planning and coordination efforts have contributed to

the Applicant's efforts in pursuing compatible relationships between project improvements and natural resources.

Sec. 226-13 Objectives and policies for the physical environment – land, air, and water quality.

(b)(3) Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters.

(b)(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i people.

The Region WRF and associated improvements should provide beneficial effects on the water quality of ground and coastal waters because it would allow untreated sewage (LCCs and cesspools) to be treated to R-1 quality before being reused for irrigation. Sewage treated to only R-2 standards would be improved to R-1 quality allowing it to be reused instead of being disposed of via injection wells. The treatment facility will incorporate design measures that significantly reduce odors during the treatment process, and will have equipment enclosed in buildings to further minimize such effects. Connection to this regional system by individual WWTPs will allow them to close and eliminate odors generated from those facilities improving air quality in the region.

Sec. 226-14 Objective and policies for facility systems – in general

(b)(1) Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with State and County Plans

(b)(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.

(b)(3) Ensure that required facility systems can be supported within resource capacities and at a reasonable cost to the user.

The Applicant is supporting the need for improved and coordinated wastewater treatment in this region which is a priority due to existing LCCs and other factors discussed in Chapter 2. Since there is no County wastewater system serving this region, private operators have been required but these systems have essentially been established independent of others.

The Applicant has properly planned this project and therefore designed the project to include future uses planned and entitled in the region. Therefore, the facility design is flexible and will be constructed in phases to accommodate anticipated users and their demands. The Applicant will be funding the improvements needed, and has coordinated the system requirements and project information with both pertinent State and County agencies. Project improvements have been planned to

provide services at a reasonable cost to users. Coordination has also been conducted by the Applicant with anticipated users connecting to this system.

*Sec. 226-15 Objectives and policies for facility systems – solid and liquid wastes
(b)(1) Encourage the adequate development of sewerage facilities that complement planned growth.*

The purpose for the Region WRF Project is to provide improved sewer collection and treatment services for residents and businesses in this region of the south shore. It will provide a regional solution to address the current issues faced by landowners with LCCs or individual WWTPs desiring to connect to a regional system. Project improvements have been planned to accommodate planned growth in the region, and such plans have been coordinated with several landowners along with State and County agencies.

5.2. STATE FUNCTIONAL PLANS

In conjunction with the county General Plans, the State Functional Plans are the primary guideposts for implementing the Hawai'i State Plan. While the Hawai'i State Plan establishes long-term objectives for Hawai'i, the State Functional Plans delineate specific strategies of policy and priority actions that need to be addressed in the short term.

The State Functional Plans guide implementation of State and County actions in the following areas: agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism, transportation, and water resources developments. The proposed Project is consistent with the following State Functional Plan objectives and policies:

Historic Preservation:

Objective B: Protection of Historic Properties

Policy B.2. Establish and make available a variety of mechanism to better protect historic properties.

Objective C: Management and Treatment of Historic Properties

Policy C.3. Explore innovative means to better manage historic properties.

Policy C.4. Encourage proper preservation techniques.

To reduce the proposed project's potential adverse effect on significant historic properties, It is recommended that a cultural resource preservation plan be prepared for the proposed - Po'ipū Regional Wastewater Reclamation Facility and Collection System project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP #50-30-10-992, a post-contact road located within the southwestern portion of the project area. Additionally the recommended cultural resource preservation plan should

also address SIHP #50-30-10-947 (post-contact railroad berm) and SIHP #50-30-10-953 (pre-contact probable burial platform), which are located in the immediate vicinity of the southwestern portion of the project area and are also recommended for preservation. This preservation plan should detail the short and long term preservation measures that will safeguard the historic properties during project construction and subsequent use of the project area.

Also because background research has revealed that it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area, it is recommended that project construction proceed under an archaeological monitoring program. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered. The specifics archaeological monitoring will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division.

Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility (see Figure 19). Due to the historic nature of these structures consultation with the State Historic Preservation Division Architecture Branch is recommended prior to any land disturbance associated with the construction of the proposed Regional WRF.

In the event cultural artifacts, subsurface human remains or other indications of human activity older than 50 years are encountered during construction activities, all work will stop immediately and the State DLNR Historic Preservation Division (SHPD) will be notified. The treatment of any human remains encountered will be determined and conducted in accordance with the applicable requirements of Chapter 6E, HRS, and Chapter 13-300, HAR. During the Project's design phase, construction plans developed will also be coordinated by reviewing agencies with the SHPD for review and comment.

State Water Resources Development Functional Plan:

Objective: Maintain the Long-Term Availability of Freshwater Supplies, Giving Consideration to the Accommodation of Important Environmental Values.

Policy B (1). Promote sound watershed and aquifer management practices

Policy B (2). Manage surface drainage areas and ground water aquifers to prevent contamination of sources of water supply.

Policy B (3). Seek a balance among development and environmental values in the planning, evaluation, permitting, and construction of water resources projects.

Objective: Assure the Availability of Adequate Water for Agriculture

Policy E (2). Increase the use of treated sewage effluent and other non-potable water for irrigation purposes

The proposed regional collection and treatment system would have a beneficial impact on groundwater resources since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs and would allow for these existing systems to be phased out over time and result in the closure of their associated injection wells. The R-1 non-potable water will also be an alternative non-potable water source and relieve some of the irrigation demand for potable water.

5.3. STATE LAND USE DISTRICT

Pursuant to Chapter 205, HRS, all lands in the State of Hawai'i are classified by the State Land Use Commission (LUC) into four major land use districts which are referred to as State Land Use Districts. The four land use districts are the Urban, Rural, Agricultural, and Conservation districts. The boundaries of these districts are shown on maps referred to as State Land Use District Boundary Maps.

The LUC's Land Use District Boundary Map for the Island of Kaua'i depicts the lands within the Project Area as being designated within the State Agricultural District and State Urban District. Figure 5-1 shows the locations of the proposed Project improvements in relation to the State Land Use District designations.

State Urban District

Approximately 2.0 acres of proposed Project Improvements are located within the State Urban District. The Project improvements located within the State Urban District include the proposed Kōloa and Villages WWPS and nearby associated collection system lines.

Permitted Uses within the State Land Use Districts are prescribed under Title 13, Chapter 205 (Land Use Commission), HRS, and the State Land Use Commission's Administrative Rules prescribed under Title 15, Subtitle 3, Chapter 15, Hawai'i Administrative Rules. Land uses within Urban Districts are governed by the ordinances or regulations of the country within which the urban district is situated. The proposed Regional RWF Project is consistent with the County's zoning ordinances which are discussed later.

State Agricultural District

Approximately 8.5 acres of proposed Project improvements are located within the State Agricultural District. The Project improvements located within the State Agricultural District include the proposed Regional WRF, infiltration basin, Crater WWPS, Eastern WWPS, and associated sewer collection system lines as shown on Figure 5-1.

Under Chapter 205, HRS, Agricultural District land having an overall master productivity rating of "A" or "B" are restricted to uses as set forth in §205-4.5(a). Under §205-4.5(a)(7), the following uses described are permitted "Public, private, and quasi-public utility lines and

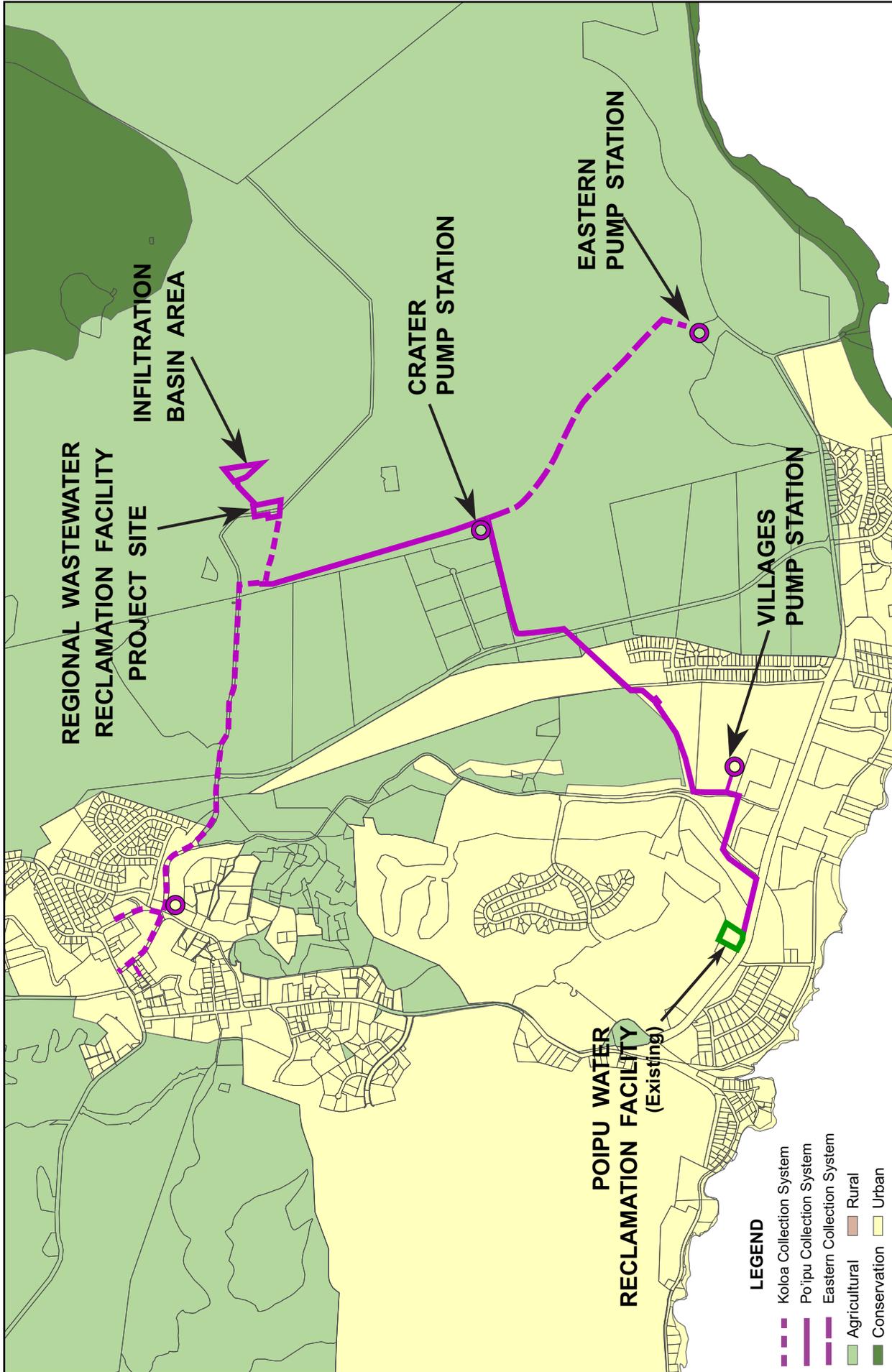


FIGURE 5-1
STATE LAND USE DISTRICT MAP

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
HOH Utilities, LLC

roadways, transformer stations, communications equipment buildings, solid waste transfer stations, major water storage tanks, and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, or treatment plants, or corporation yards, or other like structures.” Based upon Figure 3-2, the major of sewer collection system improvements within the Agricultural District are within lands having the overall master productivity rating of “A” or “B”. The Kōloa Mill site does not fall within this classification.

Based upon this category of permitted uses within the Agricultural District, the project’s sewer collection system consisting of the sewer lines and wastewater pump stations are permitted in the Agricultural District. These improvements meet the definition as both: 1) HOH is a private PUC regulated utility company implementing utility improvements; and 2) the sewer lines are utility lines and the wastewater pump stations are booster pumping stations.

The wastewater treatment facility meets the definition of a “treatment plant” and is thus not identified as a permitted use within the State Agricultural District. A State Special Permit will be required for this regional treatment facility. Since the Special Permit is for a land area that is less than 15 acres, the Special Permit will be subject to processing by the County Planning Department and approval by the County Planning Commission.

5.4. STATE COASTAL ZONE MANAGEMENT PROGRAM

The National Coastal Zone Management Program was created through passage of the Coastal Zone Management Act of 1972. Hawai‘i’s Coastal Zone Management (CZM) Program, adopted as Chapter 205A, HRS, as amended, provides a basis for protecting, restoring and responsibly developing coastal communities and resources. The objectives and policies of the Hawai‘i CZM Program encompass broad concerns such as impacts on recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the management of development. A discussion of the Project’s consistency with the objective and policies of the Coastal Zone Management Program is provided below.

(1) Recreational Resources

Objective:

(A) *Provide coastal recreational opportunities accessible to the public*

Policies:

(A) *Improve coordination and funding of coastal recreational opportunities accessible to the public.*

(B) *Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:*

- (i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*
- (ii) Requiring replacement of coastal resources having significant recreation value, including but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;*
- (iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*
- (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*
- (v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and water having recreational value consistent with public safety standards and conservation of natural resources;*
- (vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.*
- (vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and*
- (viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commissions, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.*

The proposed Project, given its nature and location, approximately 0.25 miles from the makai-most section of the Project Area along Po'ipū Road and approximately 2 miles inland from the coast, will not provide or impact coastal recreational opportunities accessible to the public.

Potential impact to coastal waters due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The use of PVC pipe will provide for corrosion resistance and longevity, and is more durable and resistant to breakage. Standard procedure for detecting leaks and breaks and for shutting down and repairing the collection system will further minimize impacts.

The potential for wastewater spills impacting coastal waters during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The proposed regional collection and treatment system would have a beneficial impact on coastal waters since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect

to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs, which currently produce R-2 (secondary) treated effluent. It would also allow for these existing systems to be phased out over time and result in the closure of their associated injection wells, most of which are located in close proximity to the shoreline.

(2) Historic Resources

Objective:

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

Policies:

- (A) *Identify and analyze significant archaeological resources;*
(B) *Maximize information retention through preservation of remains and artifact or salvage operations; and*
(C) *Support state goals for protection, restoration, interpretation, and display of historic resources.*

To reduce the proposed project's potential adverse effect on significant historic properties, it is recommended that a cultural resource preservation plan be prepared for the proposed Po'ipū Regional Wastewater Reclamation Facility and Collection System project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP #50-30-10-992, a post-contact road located within the southwestern portion of the project area. Additionally the recommended cultural resource preservation plan should also address SIHP #50-30-10-947 (post-contact railroad berm) and SIHP #50-30-10-953 (pre-contact probable burial platform), which are located in the immediate vicinity of the southwestern portion of the project area and are also recommended for preservation. This preservation plan should detail the short and long term preservation measures that will safeguard the historic properties during project construction and subsequent use of the project area.

Also because background research has revealed that it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area, it is recommended that project construction proceed under an archaeological monitoring program. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered. The specifics archaeological monitoring will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division.

Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility (see Figure 19). Due to the historic nature of these structures consultation with the State Historic Preservation Division Architecture Branch is recommended prior to any land disturbance associated with the construction of the proposed Regional WRF.

In the event cultural artifacts, subsurface human remains or other indications of human activity older than 50 years are encountered during construction activities, all work will stop immediately and the State DLNR Historic Preservation Division (SHPD) will be notified. The treatment of any human remains encountered will be determined and conducted in accordance with the applicable requirements of Chapter 6E, HRS, and Chapter 13-300, HAR. During the Project's design phase, construction plans developed will also be coordinated by reviewing agencies with the SHPD for review and comment.

(3) Scenic and Open Space Resources

Objective:

- (A) *Protect, preserve, and where desirable restore or improve the quality of coastal scenic and open space resources.*

Policies:

- (A) *Identify valued scenic resources in the coastal zone management area;*
(B) *Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;*
(C) *Preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources; and*
(D) *Encourage those developments which are not coastal depended to locate in inland areas.*

The treatment facility improvements are expected to have minimal if any impact on views of the scenic landforms of the Haupu Mountains and Puu Hunihuni. Most of the facility equipment would be located within the existing bagasse building and an existing water tank will be used. Other equipment and structures developed at the site would not be large or tall as the remaining mill structures. There are not scenic public viewing areas or lookout points in the vicinity of this project site that would be affected by this project. The surrounding area is privately owned, and not open to the general public for access into these areas.

Views of the scenic landforms from Ala Kinoiki Road would not be impacted by the project because the facilities would not be visible from this roadway. In consideration of the historic character and nature of the existing Kōloa Mill, the design of the building structures associated with the Regional WRF will emulate the architectural characteristics of the Mill to the extent possible.

(4) Coastal Ecosystems

Objective:

- (A) *Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.*

Policies:

- (A) *Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;*
- (B) *Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;*
- (C) *Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and*
- (D) *Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.*

Potential impact to coastal waters due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The use of PVC pipe will provide for corrosion resistance and longevity, and is more durable and resistant to breakage. Standard procedure for detecting leaks and breaks and for shutting down and repairing the collection system will further minimize impacts.

The potential for wastewater spills impacting coastal waters during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The proposed regional collection and treatment system would have a beneficial impact on coastal waters since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. The R-1 (tertiary) treatment process planned for the Regional WRF would be an improvement over these other packaged WWTPs, which currently produce R-2 (secondary) treated effluent. It would also allow for these existing systems to be phased out over time and result in the closure of their associated injection wells, most of which are located in close proximity to the shoreline.

(5) Economic Uses

Objective:

- (A) *Provide public or private facilities and improvements important to the State's economy in suitable locations.*

Policies:

- (A) *Concentrate coastal dependent development in appropriate areas;*
- (B) *Ensure that coastal dependent developments such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and*
- (C) *Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:*
 - (i) *Use of presently designated locations is not feasible.*

The proposed Project is intended to provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in the south shore area extending from Kōloa Town to Po'ipū. This regional system will also allow for the planned Kukui'ula development to connect to the proposed collection system for treatment at the Regional WRF. The proposed Regional WRF is intended to treat wastewater at a tertiary level that will result in R-1 quality effluent water that can be reused for beneficial applications. The R-1 water, as prescribed under the State Department of Health, is the highest level of treated wastewater. Accordingly, these wastewater infrastructure improvements would address the multiple problems plaguing wastewater collection and treatment in the south shore area, including: replacing large capacity cesspools, replacing aging on-site package plants, providing an alternative for businesses and homeowners currently relying on cesspools or septic systems, providing a wastewater alternative for proposed new developers, and generating high-quality effluent that would be available for beneficial reuse.

(6) Coastal Hazards

Objective:

- (A) *Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.*

Policies:

- (A) *Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;*
- (B) *Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;*
- (C) *Ensure that developments comply with requirements of the Federal Flood Insurance Program;*
- (D) *Prevent coastal flooding from inland projects.*

According to the FIRM prepared by FEMA, almost the entire area where project improvements are planned is located within Zone "X", "Areas determined to be outside of the

0.2% annual chance flood plain". In Kōloa town, there is a short segment of the Kōloa collection system that would have a sewer line situated within a flood designated area. This flood area is associated with Waikomo Stream that runs in a mauka to makai direction through the western half of Kōloa town. This area is designated both Zone X (flood areas with 0.2 percent annual chance flood) and Zone AE.

The proposed project is not anticipated to significantly change or affect the risk of flood hazard in the area. The sewer line collection systems would be located underground and should have minimal effect on the flood hazards in the area. The treatment facility and associated structures would be designed in conformance to applicable State and County design standards. Design plans would be submitted to pertinent agencies for ministerial review and approval during the project's design phase.

(7) Managing Development

Objective:

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

Policies:

- (A) *Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;*
- (B) *Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and*
- (C) *Communicate the potential shore and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.*

Government agencies, organizations and the general public are being notified of the proposed Project and provided an opportunity to comment on the Project through the environmental review process. Short- and long-term impacts which may result from the construction and operation of the proposed Project have been assessed in this Draft EIS.

(8) Public Participation

Objective:

(A) *Stimulate public awareness, education, and participation in coastal management.*

Policies:

- (A) *Promote public involvement in coastal zone management processes;*
- (B) *Disseminate information on coastal management issues by means of education material, published reports, staff contact, and public workshops for persons and*

- organizations concerned with coastal issues, developments, and government activities; and*
- (C) *Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

Government agencies, organizations and the general public are being notified of the proposed Project and provided an opportunity to comment on the project through the environmental review process. Short- and long-term impacts which may result from the construction and operation of the proposed Project have been assessed in this Draft EIS.

(9) *Beach Protection*

Objective:

- (A) *Protect beaches for public use and recreation.*

Policies:

- (A) *Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;*
- (B) *Prohibit construction or private erosion-protection structure seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and*
- (C) *Minimize the construction of public erosion-protection structure seaward of the shoreline.*

The proposed Project, located approximately 0.25 miles from the makai-most section of the Project Area along Po'ipū Road and approximately 2 miles inland from the coast does not involve the construction of improvements in the shoreline setback or require any erosion-protection structures.

(10) *Marine Resources*

Objective:

- (A) *Protect the protection, use, and development of marine and coastal resources to assure their sustainability.*

Policies:

- (A) *Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*
- (B) *Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;*

- (C) *Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*
- (D) *Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and*
- (E) *Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

The proposed Project is not anticipated to have any adverse impact on marine and coastal resources. Potential water quality impacts to near shore coastal waters during construction of the Project will be mitigated by adherence to State water quality regulations governing grading excavation and stockpiling. Development of the proposed Project will produce no adverse effects from storm runoff to adjacent and downstream areas.

Potential impact to coastal waters due to leakage or accidental breakage will be mitigated by proper design, construction, and operation of the facility. The potential for wastewater spills impacting coastal waters during major rain storm events will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations. The proposed regional collection and treatment system would have a beneficial impact on coastal waters since existing developments in the Project's service area which operate their own wastewater treatment facilities or packaged WWTPs would have the opportunity to connect to this regional wastewater system. It would also allow for these existing systems to be phased out over time and result in the closure of their associated injection wells, most of which are located in close proximity to the shoreline.

5.5. COUNTY OF KAUA'I GENERAL PLAN

The General Plan of the County of Kaua'i is a policy document that is intended to help guide development for the enhancement and improvement of life on Kaua'i. The document provides broad policy statements to guide land use regulations, new developments and facilities, and planning for County facilities and services. The General Plan includes land use maps for planning districts on Kaua'i. The Project Area encompasses several designations within the Kōloa-Po'ipū-Kalaheo Planning District Land Use Map, including Residential Community, Resort and Agriculture. Figure 5-2 shows the General Plan land use designations of the Project Area. This section discusses the project's conformance and consistency with pertinent policies and implementing actions from the *2000 Kaua'i General Plan*.

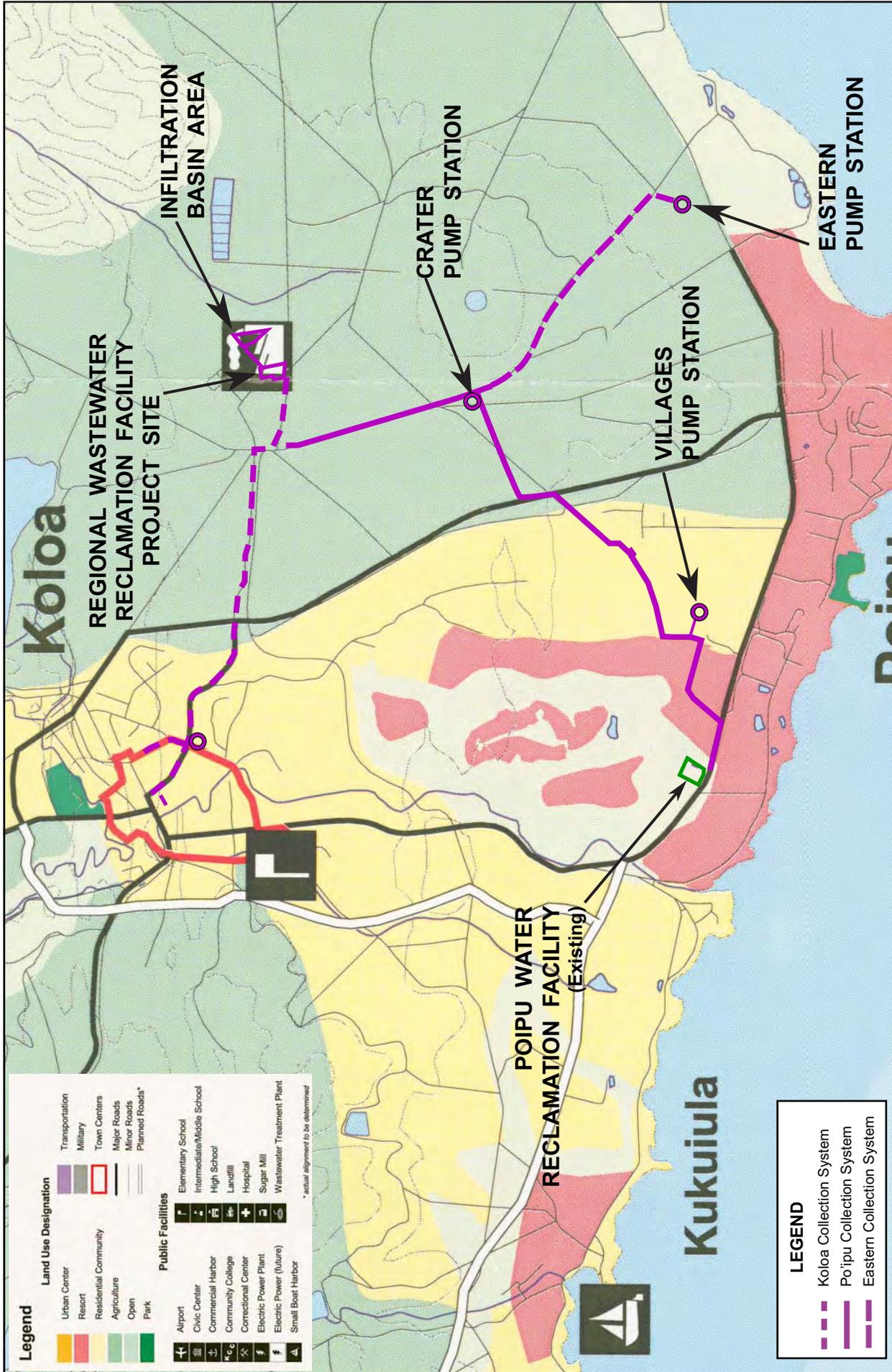


FIGURE 5-2
COUNTY OF KAUAI GENERAL PLAN LAND USE MAP
 KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilities, LLC



General Plan Land Use Map Designation:

The Project Area encompasses several designations within the Kōloa-Po'ipū -Kalaheo Planning District Land Use Map, including Residential Community, Resort, and Agricultural. Figure 5-2 shows the General Plan land use designations of the Project Area.

The General Plan policy for the Residential Community designation is as follows (Section 5.4.3.1 Policy):

- (a) *Lands included within the Residential Community designation shall be used predominantly for low- to high-density housing in towns and other residential areas. Density shall be one to 20 units per acre. Residential Community areas may also be used for commercial and industrial businesses, government facilities, and institutions.*
- (b) *High-density residential use of 10 units per acre or more shall be confined to areas served by wastewater collection and treatment facilities and major roads.*
- (c) *The location of non-residential uses shall be established through zoning. The intent is to provide convenient shopping and services to improve the livability of the various residential communities.*

The General Plan policy for the Resort designation is as follows (Section 5.4.2.1 Policy):

- (a) *Lands included within the Resort designation shall be used predominantly for housing and serving visitors to Kaua'i. In addition to hotels and multi- and single-family dwellings used for transient lodging, the Resort shall provide for commercial, recreational and public facilities that serve visitors or support the visitor industry. Lands designate Resort may also be used for residential purposes, including resort employee housing.*
- (b) *Resort-designated area shall be served with wastewater treatment plants and shall have the full range of urban services.*
- (c) *The Resort designation shall be reserved for a limited number of locations.*
 - (1) *Primary resort destination intended to accommodate 1,500 visitor units or more include Princeville, Wailua-Kapa'a, and Po'ipū -Kukui'ula.*
 - (2) *Secondary resort destinations include Nukoli'I and Lihu'e.*
 - (3) *A rural resort destination shall be located in the KapaLāwa'i -Waimea area. It shall be oriented to inn- and resident-style visitor accommodations and shall be limited to ten percent of the island's total number of visitor units.*

The proposed Project is consistent with the Residential Community and Resort designations since it will provide improved wastewater system capabilities for the Kōloa-Po'ipū area. The proposed Project is intended to provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in the south shore area extending from Kōloa Town to Po'ipū. This regional system will also allow for the planned

Kukui'ula development to connect to the proposed collection system for treatment at the Regional WRF. The proposed Regional WRF is intended to treat wastewater at a tertiary level that will result in R-1 quality effluent water that can be reused for beneficial applications. Accordingly, these wastewater infrastructure improvements would address the multiple problems plaguing wastewater collection and treatment in the south shore area, including: replacing large capacity cesspools, replacing aging on-site package plants, providing an alternative for businesses and homeowners currently relying on cesspools or septic systems, providing a wastewater alternative for proposed new developers, and generating high-quality effluent that would be available for beneficial reuse.

The applicable General Plan policies for the Agriculture designation with regard to the proposed project are as follows (Section 5.2.1 Policy):

- (a) *Lands included within the Agriculture designation shall be predominantly used for or held in reserve to be used in the future for agricultural activities. The activities include the breeding, planting, nourishing, and caring for, gathering, and processing of any animal or plant organism, including aquatic animals and plants, for the purpose of producing food or material for non-food products; the commercial growing of flowers or other ornamental plants; the commercial growing of forest products; and the commercial breeding and caring for domestic animals and pets.*
- (b) *The primary intent of the Agriculture designation is to conserve land and water resources in order to :*
 - (1) *insure and excellent resource base for existing and potential agricultural uses;*
 - (2) *assure a sufficient supply of land available for sale or lease at a cost that is economically feasible for agricultural enterprise; and*
 - (3) *promote and preserve open agricultural lands as a key element of Kaua'i's rural character and lifestyle, essential to its image as the "Garden Island" and to the continued viability and development of Kaua'i's visitor industry.*
- (c) *Lands designated Agricultural include: important agricultural lands; lands in active agricultural use; lands with potential for agriculture, silviculture or aquaculture; and other lands not suited for urban development because of location, topography, economy of public service, or other purposes related to general health, safety, and welfare.*
- (h) *The following principles shall be applied in the development of an agricultural community:*
 - (1) *Maintain irrigation works and easements where feasible and beneficial to existing or potential agricultural uses within the site of downstream; and*
 - (2) *Preserve wetlands and streams and provide a riparian buffer area to prevent land disturbance and to filter runoff.*

The proposed Project is consistent with the Agriculture designation since it will provide, in the long-term, R-1 (tertiary) water suitable for landscape irrigation and other non-domestic water

demands. Therefore, the Project will provide the benefits of an alternative non-potable water source and relieve some of the irrigation demand for potable water.

General Plan Policies:

The proposed Project is consistent with the following applicable policies:

A. Scenic Views

1. Policies:

(b) The County shall observe the following general principles in maintaining scenic resources:

- 3. Preserve the scenic qualities of lowland/open space features, such as the shoreline, the edge of a coastal bluff, a marsh, a fishpond, or a historic or cultural property. Structures should not impede or intrude upon public views of the feature and should not alter the character of the immediate area around the land feature, historic or cultural property.*

The treatment facility improvements are expected to have minimal if any impact on views of the scenic landforms of the Haupu Mountains and Puu Hunihuni. Most of the facility equipment would be located within the existing bagasse building and an existing water tank will be used. Other equipment and structures developed at the site would not be large or tall as the remaining mill structures. There are not scenic public viewing areas or lookout points in the vicinity of this project site that would be affected by this project. The surrounding area is privately owned, and not open to the general public for access into these areas.

Views of the scenic landforms from Ala Kinoiki Road would not be impacted by the project because the facilities would not be visible from this roadway. In consideration of the historic character and nature of the existing Kōloa Mill, the design of the building structures associated with the Regional WRF will emulate the architectural characteristics of the Mill to the extent possible.

B. Historic and Archaeological Sites

1. Policy:

(a) Preserve important archaeological and historic sites and provide: 1. a buffer area between the site and adjacent uses; and 2. public pedestrian access, as appropriate to the site.

The project would be consistent with these policies since necessary measures would be implemented in the project's design and construction to mitigative potential effects on historic sites as discussed in this document. To reduce the proposed project's potential adverse effect on significant historic properties, It is recommended that a cultural resource preservation plan be prepared for the proposed project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for historic properties in the area.

Additionally it was recommended that a cultural resource preservation plan be prepared. This preservation plan should detail the short and long term preservation measures that will safeguard the historic properties during project construction and subsequent use of the project area. Also because background research has revealed that it is likely that subsurface historic properties may be present it is recommended that project construction proceed under an archaeological monitoring program to facilitate the identification and proper treatment of any burials that might be discovered. Thus, the efforts conducted as part of the planning and assessment of this project is consistent with these policies.

C. Watersheds, Streams, and Water Quality

1. Policy

(b) *Site Development. Plan, design and develop sites to:*

- (2) *Protect areas that are particularly susceptible to erosion and sediment loss – i.e. stream banks;*
- (4) *Limit land disturbance activities such as clearing and grading, and cut and fill to reduce erosion and sediment loss;*

(c) *Construction Site Erosion and Sediment Control*

- (1) *Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction.*
- (2) *Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.*

Construction activities associated with the proposed wastewater system improvements are not likely to significantly impact surface or coastal water resources in the Project vicinity. Potential impacts to the quality of surface or coastal waters during construction of the proposed facility improvements will be mitigated by adherence to State and County water quality regulations governing grading, excavation, and stockpiling. A NPDES General Permit for Storm Water Associated with Construction Activity, administered by the State DOH will be required to control storm water discharges. Mitigation measures will be instituted following site-specific assessments, incorporating appropriate structural and/or non-structural BMPs such as silt fences and minimizing time of exposure between construction and re-vegetation to control erosion and to minimize environmental impacts to water quality and aquatic biota downslope from the project sites.

D. Native Hawaiian Rights

1. Policy:

- (a) *Under the State Constitution and the County Charter, the County of Kaua'i is empowered to promote the health, safety and welfare of all inhabitants without discrimination as to ethnic origin. As part of carrying out its responsibilities under the Constitution and the Charter, the County recognized the rights of native Hawaiians and the laws concerning lands and waters that have been established through the State Constitution, State and*

federal laws, and State and Federal court decisions. No County ordinance or rule shall modify or diminish these rights:

1. *Kuleana lands, water rights and access rights provided under the Kuleana Act of 1850, as recognized in current statutes, rules and court decisions.*
2. *Konohiki and hoa'aina fishing rights, provided under the 1839 Law of Kamehameha, as modified by subsequent legislative acts and court decisions.*
3. *Traditional and customary rights of Native Hawaiians, such as for access and gathering, provided under the State Constitution and Hawai'i Revised Statutes, as interpreted by the courts (i.e., the PASH case).*
4. *Burial rights provided under the Hawai'i Historic Preservation act and the federal Native American Graves Repatriation Act.*
5. *Preservation of historic properties and archaeological resources provided under the federal Archaeological Resources Protection Act of 1979; the National Historic Preservation Act of 1966; and the Hawai'i Historic Preservation Act.*

To reduce the proposed project's potential adverse effect on significant historic properties, it is recommended that a cultural resource preservation plan be prepared for the proposed Po'ipū Regional Wastewater Reclamation Facility and Collection System project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP #50-30-10-992, a post-contact road located within the southwestern portion of the project area. Additionally the recommended cultural resource preservation plan should also address SIHP #50-30-10-947 (post-contact railroad berm) and SIHP #50-30-10-953 (pre-contact probable burial platform), which are located in the immediate vicinity of the southwestern portion of the project area and are also recommended for preservation. This preservation plan should detail the short and long term preservation measures that will safeguard the historic properties during project construction and subsequent use of the project area.

Also because background research has revealed that it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area, it is recommended that project construction proceed under an archaeological monitoring program. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered. The specifics archaeological monitoring will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division.

Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility (see Figure 19). Due to the historic nature of these structures consultation with the State Historic

Preservation Division Architecture Branch is recommended prior to any land disturbance associated with the construction of the proposed Regional WRF.

In the event cultural artifacts, subsurface human remains or other indications of human activity older than 50 years are encountered during construction activities, all work will stop immediately and the State DLNR Historic Preservation Division (SHPD) will be notified. The treatment of any human remains encountered will be determined and conducted in accordance with the applicable requirements of Chapter 6E, HRS, and Chapter 13-300, HAR. During the Project's design phase, construction plans developed will also be coordinated by reviewing agencies with the SHPD for review and comment.

E. Wastewater Treatment

1. Policy

- (a) The County and private utilities shall develop and operate wastewater collection, treatment, and disposal systems as necessary to serve urban areas for the purposes of safeguarding public health, potable water supplies, and the quality of stream and ocean waters.*
- (b) The County and private developers should coordinate planning, development, and operation and management of wastewater systems in accordance with long-range facility plans.*

The proposed Project is intended to provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in the south shore area extending from Kōloa Town to Po'ipū. This regional system will also allow for the planned Kukui'ula development to connect to the proposed collection system for treatment at the Regional WRF. The proposed Regional WRF is intended to treat wastewater at a tertiary level that will result in R-1 quality effluent water that can be reused for beneficial applications. The R-1 water, as prescribed under the State Department of Health, is the highest level of treated wastewater. Accordingly, these wastewater infrastructure improvements would address the multiple problems plaguing wastewater collection and treatment in the south shore area, including: replacing large capacity cesspools, replacing aging on-site package plants, providing an alternative for businesses and homeowners currently relying on cesspools or septic systems, providing a wastewater alternative for proposed new developers, and generating high-quality effluent that would be available for beneficial reuse.

5.6. COUNTY OF KAUA'I KŌLOA-PO'IPŪ-KALAHEO DEVELOPMENT PLAN

The County's Kōloa-Po'ipū-Kalaheo Development Plan, adopted by the County ordinance in 1983, provides physical, social and economic measures which relate specifically to these communities. The Kōloa-Po'ipū-Kalaheo Development Plan land use designations for the Project Area are Agriculture, Residential and Open. The proposed Project is consistent with the following goals and objectives in the Kōloa-Po'ipū -Kalaheo Development Plan.

Public Facilities

Encourage development of roads, sewerage, water facilities, drainage improvements and other public facilities necessitated by existing uses and proposed growth.

The proposed Project is intended to provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in the south shore area extending from Kōloa Town to Po'ipū. This regional system will also allow for the planned Kukui'ula development to connect to the proposed collection system for treatment at the Regional WRF. The proposed Regional WRF is intended to treat wastewater at a tertiary level that will result in R-1 quality effluent water that can be reused for beneficial applications. Accordingly, these wastewater infrastructure improvements would address the multiple problems plaguing wastewater collection and treatment in the south shore area, including: replacing large capacity cesspools, replacing aging on-site package plants, providing an alternative for businesses and homeowners currently relying on cesspools or septic systems, providing a wastewater alternative for proposed new developers, and generating high-quality effluent that would be available for beneficial reuse.

5.7. COUNTY OF KAUA'I COMPREHENSIVE ZONING ORDINANCE AND ZONING

The County's Comprehensive Zoning Ordinance (CZO) sets forth standards for land development and construction of buildings and other structures in the County. The CZO establishes land use districts and delineates the respective types of permitted uses and the development that can take place in those districts.

The zoning designations for the proposed Project improvements are indicated in Table 5-1. Figure 5-3 shows the current zoning designations of the proposed Project improvements.

**Table 5-1
Existing County of Kaua'i Zoning Designations**

Proposed Improvements	Zoning Designation
Regional WRF	Agriculture District (A)
Infiltration basin	Agriculture District (A)
Kōloa WWPS	Residential District (R-20)
Villages WWPS	Open District (O)
Crater Tank WWPS	Agriculture District (A)
Eastern WWPS	Agriculture District (A)
Wastewater Transmission Lines	Residential Districts (R-6 and R-20), Open District (O), and Agricultural District (A)

Pursuant to the County's CZO, private utilities and facilities are not outright permitted uses in the Residential, Agriculture and Open Districts. Therefore, a County Use Permit will be required for the proposed wastewater system improvements located in the Residential,

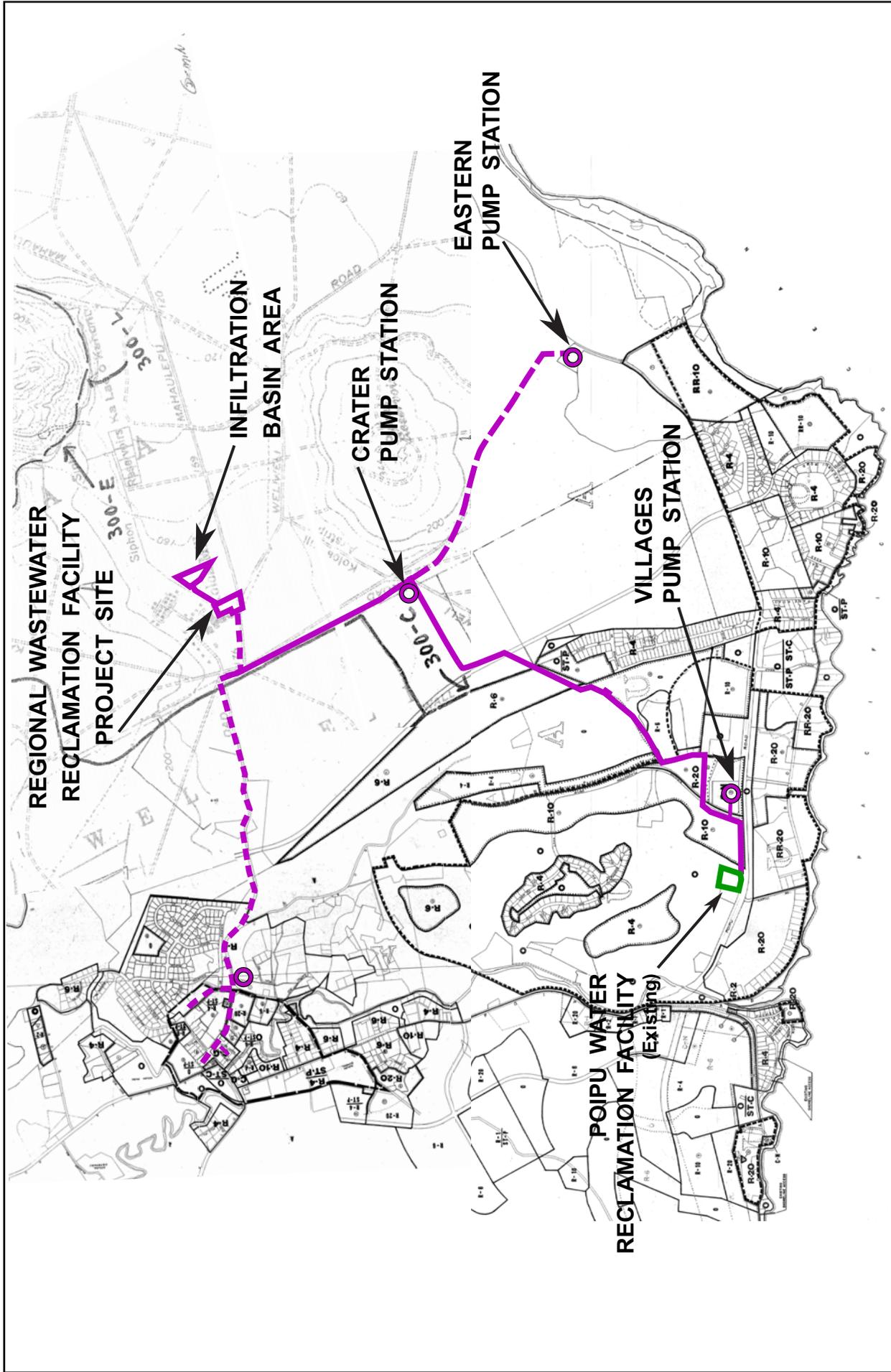


FIGURE 5-3
COUNTY OF KAUAI ZONING MAP

KOLOA-POIPU REGIONAL WASTEWATER RECLAMATION FACILITY PROJECT
 HOH Utilites, LLC

- LEGEND**
-  Koloa Collection System
 -  Po'ipu Collection System
 -  Eastern Collection System



Agriculture and Open Districts. Since a County Use Permit will be required, a County Class IV Zoning Permit will also be required for the proposed Project improvements. In addition, a State Special Permit (less than 15 acres) will be required for this project. The State Special Permit, Use Permit and Class IV Zoning Permit would be concurrently processed by the County Planning Department and approval would be granted by the County Planning Commission.

5.8. COUNTY OF KAUA'I SPECIAL MANAGEMENT AREA

The Hawai'i Coastal Zone Management Act, Chapter 205A, HRS contains the general objectives and policies upon which all counties have enacted ordinances to establish Special Management Areas (SMA). Any "development" within the SMA requires an SMA Use Permit administered by the County of Kaua'i Planning Department. Approval of a SMA Use Permit is granted by the County Planning Commission.

The proposed Project improvements are located outside of the SMA boundary established pursuant to the Hawai'i Coastal Zone Management Law, Chapter 205A, HRS. Therefore, a SMA Use Permit will not be required for the proposed Project improvements.

6. ALTERNATIVES CONSIDERED

This chapter identifies alternatives to the proposed Regional WRF Project that were considered and evaluated. The alternatives considered include: 1) not implementing development of the Project, otherwise referred to as the No Action Alternative, 2) alternative location for the proposed Regional WRF, and 3) alternative methods of secondary treatment for the Regional WRF. Alternatives were evaluated in relation to the project need and objectives along with associated environmental impacts.

6.1. NO ACTION ALTERNATIVE

The No Action Alternative would entail not proceeding with the Regional WRF improvements, and the existing methods of wastewater treatment and disposal occurring within the Kōloa and Po'ipū areas would continue. This alternative was eliminated because it would not meet the project need and objectives. It would also make compliance with EPA mandated regulations difficult, cause significant economic impacts on property owners using LCCs, and not improve water quality.

6.1.1. Description of No Action Alternative

Under this alternative, existing individual homeowners using cesspools for wastewater disposal in Kōloa and Po'ipū would continue with this manner of treatment. Existing businesses or housing projects within Kōloa Town would have to continue relying on large capacity cesspools for their wastewater disposal. It is expected that these businesses or residential developments would not be able to develop alternative treatment systems in the near future due to: 1) inadequate land area available within Kōloa Town; 2) the high costs to undertake designing, permitting, and constructing improvements; and 3) no existing County sewer collection system present or planned in this area for property owners to connect to.

The 16 existing resort developments in Po'ipū operating their own privately-owned packaged wastewater treatment facilities would continue. These packaged plants would continue producing R-2 effluent quality water that is disposed of via the injection wells predominantly located along the shoreline. It is expected these packaged WWTPs would continue into the future for same reasons covered under the LCCs in Kōloa Town. New developments in the area would construct new privately-owned packaged wastewater plants to serve their wastewater needs.

6.1.2. Evaluation of Alternative

This alternative would not adequately address the need for the project along with the project objectives because the existing methods of wastewater treatment by developments in Kōloa Town and Po'ipū would need to continue.

Existing businesses and residential developments utilizing LCCs for wastewater disposal would not comply with the EPA regulation requiring the closure or upgrade of these LCCs. Property owners with LCCs would encounter significant economic hardship trying to find solutions to comply with the EPA regulation or possibly receive violations from that agency for non-compliance. Individual residences using cesspools would also not have the option to connect to a sewer system and close their cesspool.

Existing packaged WWTPs in the area will not have the opportunity to connect to the regional system, close their associated injection wells, and phase these systems out over time. These existing packaged plants do not include a tertiary process for treating wastewater to obtain the highest quality effluent water (R-1). Future developments would need to develop their own packaged WWTP's because there would not be a County or private regional system to connect to. The existing Po'ipū WRF would not have enough capacity to accommodate the long-term future demands generated in this region. Therefore, the lower quality of effluent being discharged from packaged WWTPs would continue and not improve water quality along the coastline. It would also not allow for the effluent discharged to be reused for other uses and lessen the demand placed on potable water resources.

6.2. POSTPONING ACTION ALTERNATIVE

The Postponing Action Alternative is similar to the No Action Alternative. It would entail not proceeding with the Regional WRF improvements pending further study of the proposed action or having the County study the feasibility of planning, funding, and constructing their own regional wastewater system. This alternative was eliminated because it would not meet the project need and objectives, and have similar environmental and economic consequences as under the No Action Alternative.

6.2.1. Description of Postponing Action Alternative

Under this alternative, further planning and study would be conducted by the Applicant to assess the proposed Regional WRF project improvements. Related to this would be waiting for the County to study and fund the implementation of their own regional wastewater treatment facility and collection system.

Existing individual homeowners using cesspools for wastewater disposal in Kōloa and Po'ipū would continue with this manner of treatment. Existing businesses or housing projects within Kōloa Town would continue relying on large capacity cesspools for their wastewater disposal. The 16 privately-owned packaged wastewater treatment facilities would continue operating and producing R-2 effluent quality water that is disposed of via the injection wells located along the shoreline. New development would construct on-site privately-owned packaged wastewater treatment plants.

6.2.2. Evaluation of Alternative

This alternative would not adequately address the need for the project along with the project objectives because the existing methods of wastewater treatment by developments in Kōloa Town and Po'ipū would need to continue.

The reasons discussed under the evaluation of the No Action Alternative would similarly apply under this alternative. Existing businesses and residential developments utilizing LCCs would not comply with the EPA regulation, and property owners with LCCs would encounter significant economic hardship trying to find solutions to comply or waiting for the County or a private regional system to be developed. Individual residences using cesspools would also not have the option to connect to a sewer system and close their cesspool.

Existing packaged WWTPs in the area will not be able to connect to a regional system for some time until another County or private solution is implemented. Future developments would likely develop their own packaged WWTP's instead of waiting for another solution to be studied and implemented.

The Applicant has already expended significant resources to thoroughly plan this Regional WRF project and identify necessary system facilities and collection system improvements. Coordination with other property owners has occurred to establish feasible collection system routes and obtain a suitable site for the treatment facility. Consultations with the community have also been conducted by the Applicant to coordinate their plans and obtain community input. Therefore, further study by the Applicant is not necessary or practicable, and would not provide significant beneficial changes to the environmental impacts discussed in this document. Other site and design alternatives considered are covered in separate sections as well. Delaying this project would also have an economic impact due to increased construction costs necessary to then fund the project.

Postponing the project to instead allow the County to plan, design, and construct their own regional wastewater system was determined to not be a feasible or practicable alternative. The County presently has no plans for providing regional wastewater collection and treatment in this region. Furthermore, existing wastewater facilities are all privately-owned and operated.

The County's effort needed to fund and implement the planning and eventual construction of a regional system may take several years due to County budget limitations and the process required. The County would likely have to conduct the same effort already completed by the Applicant in finding a suitable treatment facility site and collection system routes. The environmental review and entitlement process would also need to be conducted which is already occurring by the Applicant for this project. Finally, finding monetary resources to fund the construction of the project given their current budget and present economic climate would likely be difficult and take several additional years.

6.3. ALTERNATIVE LOCATION FOR THE REGIONAL WRF

An alternative location for the Regional WRF site considered and evaluated was the existing Po'ipū WRF site. This alternative location was eliminated because it would have additional significant environmental effects than that anticipated at the Kōloa Mill site.

6.3.1. Description of Alternative Location

The existing Po'ipū WRF is owned by HOH Utilities, LLC and located on approximately 2.0 acres of land adjacent to and mauka of Po'ipū Road. The site is approximately 0.2 mile west of the intersection of Kiahuna Plantation Drive. The facility currently treats wastewater flows from various resort developments in Po'ipū, as well as the Po'ipū Shopping Village, and has a design capacity of 1.0 mgd.

6.3.2. Evaluation of Alternative

The existing Po'ipū WRF site does not have enough space to accommodate a facility planned to serve on a regional basis. The proposed treatment facility requires an area of about two acres, and the existing Po'ipū WRF site is fully utilized using their available two acres. Therefore, the site would need to be expanded by at least four acres for the regional facility plus acreage for the infiltration basin. Additional area would need to be acquired either next to the site along Po'ipū Road or behind the site where the Kiahuna golf course and residential subdivisions exists, and future residences are planned.

Treatment plants are generally viewed as somewhat undesirable facilities to be located in a neighborhood particularly near residences or commercial uses. Land use compatibility issues are generally associated with visual aesthetics, odor, and noise from operations. Therefore, the expansion of a treatment facility at the Po'ipū WRF site is expected to generate significant opposition from the community, surrounding visitor oriented developments, and area residents.

Substantial concerns over visual impacts would be expected from the community for such a larger facility present along Po'ipū Road, and would negatively affect the resort oriented character of that Po'ipū area. Odor issues can be mitigated to a certain degree by equipment modifications and housing them within a building. However, there would still be some odors generated by this regional facility which would increase present odors already being generated from the existing Po'ipū WRF. Furthermore, the infiltration basin would be an open pond that will unavoidably generate odors if and when utilized.

6.4. SECONDARY TREATMENT DESIGN ALTERNATIVES

Secondary treatment alternatives for the Regional WRF were identified and evaluated in preliminary engineering assessments conducted for this Project. A non-published basis of design report was completed for the Applicant and used in the selection of the proposed treatment design. Such alternatives considered included: 1) Conventional Activated Sludge-

Extended Aeration (CAS), 2) Sequencing Batch Reactor (SBR), 3) Membrane Bioreactor (MBR), and 4) Advanced Ecological Engineering Systems (AEES). These alternative treatment methods were eliminated because they were not as feasible and practical alternatives to the proposed design method.

6.4.1. Description of Treatment Alternatives

A summary of the alternative secondary treatment design methods considered are provided. Secondary treatment processes exist in a variety of configurations, most of which are variations of the conventional activated sludge process.

1. Conventional Activated Sludge-Extended Aeration. This generally consists of a long and narrow aerated basin followed by clarification. The extended aeration process is a modification of the CAS process that provides a longer retention time of the wastewater in the tank, a better organic removal, less biosolids generation and nitrification. These characteristics make it suitable for small facilities for its ease in operation, low solid yields and generally good settle ability.
2. Sequencing Batch Reactor. This is one of the oldest forms of wastewater treatment. The SBR is a mixed culture, suspended growth activated sludge treatment system that is operated on a fill-and-draw basis. It uses a single tank for waste stabilization and solids separation, thereby eliminating the need for secondary clarifiers. The semi-continuous operation of the SBR consists of four distinct phases (fill, react, settle, and decant).
3. Membrane Bioreactor. This is the most innovative wastewater treatment process since the invention of the activated sludge process. Membranes are used to provide the separation of the final effluent from the mixed liquor, and the problem of poor settling of sludge with other methods is eliminated.
4. Advanced Ecological Engineering Systems. This wastewater treatment process is centered on a series of aerated tanks which contain microbes, insects, and invertebrates that digest wastewater as well as aquatic plants that cover the surface of the tanks. The idea behind the treatment process is that mesocosms, which mimic natural ecosystems, can be used to treat wastewater. The goal is for the treatment system to contain sufficient biological diversity to allow it to adapt itself through natural selection.

6.4.2. Evaluation of Alternative

The secondary alternative treatment methods considered all involve alternative equipment and design methods to process wastewater which can be accommodated within the project site proposed at the Kōloa Mill. The alternative methods considered would also not require a change to the location of the proposed regional treatment facility. The sewer collection system routes and associated improvements would not change under these alternative treatment methods either because the facility site would remain the same. Therefore, these alternative

methods would have minimal change to the environmental impacts discussed in this document which are associated with the proposed project and treatment method.

The Regional WRF Project's proposed secondary treatment design method discussed in Chapter 2 was selected because it provides a higher quality of effluent water for reuse, and is a more operations friendly process that will support the economic operations of this facility. Several criteria were considered in the engineering report evaluating the treatment alternatives. Such criteria included: 1) costs (capital costs, operation and maintenance, impact on rate payers); 2) operations (modular design and expansion, operational expertise requirements, reliability, R-1 effluent requirements); and 3) social considerations (compatibility with neighbors, odor potential, visual effects, noise). A summary of the factors associated with the alternative treatment designs is provided.

1. Conventional Activated Sludge-Extended Aeration. This method had the lowest cumulative rating of the alternatives. The process has settling problems, as well as foaming and bulking sludge, which is a common problem for most suspended growth systems.
2. Sequencing Batch Reactor. This method was ranked second of the four alternatives eliminated. The SBR process has good settling conditions, however, the controls for the process are more complex than most activated sludge processes. Thus, the long-term operation of this method was a factor.
3. Membrane Bioreactor. This method was ranked highest of the four alternatives eliminated. Membrane fouling is an issue that is the single biggest challenge of this technology because of the large amount of air and chemicals required to control the fouling. Other challenges are high equipment cost, the need for fine screening of influent to prevent damage to the membranes, and high power costs.
4. Advanced Ecological Engineering Systems. This method was ranked third of the four alternatives eliminated. There are limitations and concerns associated with this approach because the system should be dependable and robust to effectively treat and reclaim wastewater. The dependency on plant life and other organisms for treatment increases the risk that dependable, consistent treatment to regulatory (R-1) limits will be achievable at all times, under all conditions. The operation and maintenance required to manage, maintain, harvest and dispose of the plants was another consideration.

7. CONTEXTUAL ISSUES

7.1. SECONDARY EFFECTS AND CUMULATIVE IMPACTS

This section discusses the project's secondary effects and the cumulative impacts on the environment.

7.1.1. Secondary Effects

Secondary effects, 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. Secondary impact analyses are appropriately concerned with impacts that are sufficiently "likely" to occur and not with the speculation of any impact that can be conceived of or imagined.

The Regional WRF Project is expected to have minimal if any secondary effects. The regional wastewater treatment facility and collection system improvements should not have any secondary effects on the resident and visitor population, land use patterns, public facilities and infrastructure, and the natural environment in the Kōloa and Po'ipū areas. This wastewater project does not include any residential units or visitor units that may cause secondary effects on public facilities such as schools, and infrastructure such as roadways. The previous sections of this document provided further discussion of the project's impacts supporting this determination.

The project should have minimal if any effect on land use patterns in the Kōloa to Po'ipū region. The sewer collection system would predominantly be located within or along existing roadways or cane haul roads. The route of the Po'ipū collection system generally follows the path of an existing County waterline. The phased construction of the different collection systems would be based upon the progress of other developments. Therefore, these sewer lines and the associated pump stations would not influence land use patterns in the area.

Construction of the treatment facility within a portion of the existing Kōloa Mill site should also have minimal if any effect on future land use patterns surrounding the mill area. The mill is located on private property comprised of former plantation agricultural land which extends over 1,000 acres. Therefore, changes in the land use patterns of this area would be dictated by that landowner. There are no known development plans for this surrounding area, and the wastewater treatment facility should have minimal effect in influencing the future use of the area. Such decisions would likely be based upon other economic considerations.

Changes to land use patterns and future development in the surrounding area also fall under the jurisdiction and control of the County of Kaua'i. The County's land use policies and

entitlements process via their General Plan and under their comprehensive zoning code ultimately controls what developments are permitted in the region. The surrounding area is presently designated for agricultural use under the Kōloa-Po'ipū-Kalāheo Planning District Land Use Map under the *2000 Kaua'i General Plan*. Thus, the treatment facility improvements planned on this mill site is not expected to significantly cause secondary impacts altering County approved land uses and settlement patterns in the area.

Construction of this project is expected to generate some short-term impacts associated with construction activities. Creation of these short-term construction jobs are expected to be filled by workers from the Island of Kaua'i and thus not generate any permanent in-migrating of workers to the island. It is anticipated that qualified local contractors on Kaua'i, or if necessary within the State of Hawai'i, would be used for the project's construction. Therefore, construction of the project should not contribute to significant secondary impacts associated with in-migration of workers.

7.1.2. Cumulative Impacts

Cumulative impacts are typically defined as the effects on the environment which result from the incremental impact of a project when added to past, present, and reasonably foreseeable future actions. The estimation of future impacts is important for cumulative impact analysis. However, the focus must be on "reasonably foreseeable" actions which are those that are likely to occur or probable, rather than those that are merely possible or subject to speculation. The prediction of reasonably foreseeable impacts thus requires judgment based on information obtained from reliable sources such as adopted plans and similar documents.

The build-out of this project is projected to be completed by the year 2015 when the wastewater treatment capacity is expanded to 1.0 mgd ADF. The collection system improvements would also be completed with the Po'ipū and Eastern Collection system components constructed by this timeframe. This would allow connection of the existing Po'ipū WRF to the Regional WRF. It would provide service to all areas within Po'ipū and allow existing individual WWTPs in the area to connect.

There are several developments planned in the Kōloa and Po'ipū areas based upon information from the *Kōloa-Po'ipū Area Circulation Plan* (Charlier, April 2007). However, that information did not identify the status and phasing plan for them. Some planned developments did not have all entitlements in place, and the current economic climate has delayed the implementation of those developments. Therefore, a reasonable assumption was made in identifying those developments within the area of project improvements that may occur within the 2015 study timeframe which are identified below.

1. Kōloa Marketplace. This commercial development is located along Maluhia Road mauka (north) of Weliweli Road.
2. Kōloa Creekside. This is a mixed multi-family and single-family residence development located along the makai (southwest) side of Weliweli Road.

3. Po'ipū Town Center. A commercial development planned along Po'ipū Road near its intersection with Kiahuna Road.
4. Po'ipū Beach Villas. A multi-family development planned below (makai of) Po'ipū Road near its intersection with Kapili Road.
5. Kukui'ula. A mixed multi-family and single family residential development, which also includes some resort amenities and commercial development.

These developments that may occur during the 2015 timeframe are all located in the area of the sewer collection system components of the Regional WRF project. There are no known developments planned in the area of the Kōloa Mill that would occur within this study timeframe and contribute to significant cumulative impacts on the natural and human environment. Therefore, the discussion of cumulative impacts is focused on the effects associated with the sewer collection system portions.

Information on impacts presented in the other sections of this document was used to address the applicable cumulative effects associated with the project given other reasonably foreseeable future actions being implemented. Based upon that information, the project is not expected to result in significant cumulative impacts on the surrounding environment and further discussion is provided.

Impacts on Natural Environment

In terms of the natural environment and resources, no significant long-term cumulative impacts are expected with the project on the various resources. The Kōloa and Po'ipū sewer collection system routes would be constructed across and within existing roadways, along roadways, and along an existing waterline route. Once constructed, the corridor disturbed will be returned to the existing condition and roadways affected would be repaved. Improvements would be constructed based upon design plans reviewed and approved by pertinent government agencies, and necessary conditions and mitigative measures implemented.

Project improvements would not have cumulative effects on existing topography and geology because conditions would be replaced after installation of the sewer collection system. There would be no notable effects associated with natural hazards. Botanical and faunal resources would similarly not be significantly affected because there were no notable species present along these sewer line corridors.

The project would not cause significant cumulative impacts on archaeological resources because there are none present within most of the collection system routes. Mitigative measures would be implemented for a section of the Po'ipū collection system based upon the previously identified sites that were addressed. Such measures include a cultural resource preservation plan and archaeological monitoring program. Other developments in the area would similarly need to implement appropriate mitigative measures required by the SHPD. Therefore, once constructed the sewer collection system in Po'ipū would not contribute to

cumulative impacts on the previously identified sites. Implementation of mitigative measures would make certain that impacts to these sites do not occur during short-term construction activities. Implementation of these mitigative measures would also address cultural concerns raised for the protection of sites located both above ground and subsurface.

Surface water resources would not be affected because there are none present along these sewer line corridors. Coastal waters may be affected if a significant storm occurs during construction activities beyond which best management practices have been designed and permitted for. However, areas affected by the project's sewer line work would be minor since it would mainly consist of an open trench as compared to the grading of a large site.

The project would have a beneficial cumulative effect on groundwater resources because it would allow for the closing of existing LCCs, cesspools, and individual packaged WWTPs utilizing injection wells for the disposal of R-2 quality effluent. The cumulative effect of this would be to improve the quality of effluent water being discharged into the aquifer and coastal waters.

Cumulative impacts would be more associated with temporary construction activities the timing of this project occurs concurrently with other developments in the surrounding area. This situation would contribute to increased temporary disruptions and nuisance effects such as increased noise, dust, and traffic delays. However, mitigative measures implemented as discussed in other sections of this document would reduce the impacts and be short-term. During construction, working areas of the sewer collection system would be completed, and affected areas would move along the corridor and away from construction activities for the other developments that are site specific. Thus, cumulative impacts from project construction activities would be minimized as the sewer collection system work moves away from those other development sites.

Impacts on Human Environment

In terms of the human environment, no significant long-term cumulative impacts are expected with the project. The Kōloa and Po'ipū sewer collection system routes would not have cumulative impacts on agricultural activities because none are occurring within the other identified development areas. The sewer collection system would similarly not impact agricultural activities. The project would not have a cumulative impact on existing water infrastructure facilities because none are required for the sewer collection system routes.

Cumulative impacts on air quality and noise would be associated with short-term construction activities if the timing of the project with other developments occurs concurrently. As previously discussed, impacts would contribute to increased nuisance effects from noise and dust. However, mitigative measures implemented would reduce the impacts. No cumulative impacts would occur on visual resources because the sewer collection systems would be located underground with the exception of some equipment for the sewer pump stations.

There should also be minimal cumulative impacts on public facilities such as schools, parks, and medical facilities based upon the impact discussions from previous sections of this document. The project would not contribute to long-term impacts on these public facilities; therefore, any cumulative effects would be attributed to the other developments. The only potential for cumulative impacts would be associated with temporary construction activities if occurring at the same time with the other developments in the area. Compliance with regulations, following agency permit requirements, and implementing best management practices should mitigate these temporary nuisance effects.

The project would not contribute to notable cumulative impacts on most infrastructure and utilities in the area which include drainage systems and electrical and communication. Construction of the project would contribute to some solid waste needing to be disposed, but the cumulative effect is not expected to be significant. The collection system would consist predominantly of trench work for which materials excavated would be replaced and compacted to return site conditions. Thus, the contribution of solid waste from this project would be minor in relation to that generated from other developments occurring at the same time.

No long-term cumulative impacts would be associated with this project on roadway or highway facilities because it would generate five or less trips during the peak hour for employees working at the treatment facility. These trips would not occur in the vicinity of other developments planned contributing to cumulative effects. Only short-term effects associated with increased traffic delays near roadways from construction activities could occur if construction of other developments occurs during the same time. Traffic control plans would be implemented for this project that are reviewed and approved by pertinent government agencies to address this.

The project would have a beneficial cumulative impact on wastewater facilities because it will create a regional system to serve the Kōloa to Po'ipū region. Other developments constructed during the 2015 study timeframe would be able to connect to this sewer collection system for treatment at the plant.

7.2. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF HUMANITY'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section discusses the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity. The extent to which the proposed action involves trade-offs among short-term and long-term gains and losses are discussed. The extent to which the project forecloses future options, narrows the range of beneficial uses of the environment, or poses long-term risks to health or safety are addressed.

Chapter 2 of this document discussed the project site for the wastewater treatment facility along with the areas affected by the associated sewer collection system. The planned facility site at the Kōloa Mill along with the nearby mud pond is not being used for sugar cane production since operations closed many years ago. These areas are not being used for other agricultural operations. The bagasse building was being utilized by a contractor making trusses on a temporary lease arrangement with the landowner knowing that building is already designated for a future use.

The sewer collection system routes consist of existing roadways, cane haul roads, or privately-owned undeveloped properties. The applicant has coordinated their project plans with the respective private landowners who are supportive of this project. Coordination with the State and County on roadways affected has also occurred.

Development of the wastewater treatment facility at the Kōloa Mill site would not curtail nor impact short-term use of that site based upon the previous discussion. Construction of the sewer collection system would also not curtail nor impact short-term use of those areas affected. The long-term productivity of having a regional wastewater treatment facility and associated collection system serving the Kōloa, Po'ipū, and Kukui'ula areas would be a significant benefit to the community and environment.

In terms of trade-offs resulting from long-term use of the Kōloa Mill site along with properties for the sewer collection system, the improvements would not curtail nor impact long-term uses planned for those areas. There are no current plans for the mill buildings, and the adaptive reuse of the bagasse building and water tank would utilize those structures instead of having them stand idle. Areas where the collection system improvements will be located are similarly not planned for future use. Areas within roadways will be coordinated with the respective agencies to ensure existing utilities within them are not impacted. Other properties affected, such as the cane haul roads, would not be negatively impacted by the long-term use of for the sewer collection system. Necessary easements would be obtained from the private landowners.

The Regional WRF Project would commit the affected areas within properties to a particular urban use. As with any other project occurring on Kaua'i, these improvements would narrow the range of other possible beneficial uses for those areas, and would foreclose future options for those areas affected. However, the adaptive reuse of some structures within the Kōloa Mill would be a beneficial use to the community and environment as discussed in this document. There are no other uses currently planned for the Kōloa Mill site and its associated structures that would provide more beneficial uses. Based upon the analysis and assessment results discussed in this document, this wastewater treatment facility does not pose long-term risks to health or safety.

The sewer collection system would similarly narrow the range of other beneficial uses for those properties affected. However, the areas affected would not adversely impact the planned development of those privately-owned properties. Sewer plans have been coordinated with property owners, and that information is being integrated into their development plans. Further, having the sewer collection system will allow them to connect to this regional system for the disposal and treatment of wastewater. The results of this document further determined that these collection systems do not pose long-term risks to health or safety.

7.3. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

This section provides a description of all irreversible and irretrievable commitments of resources that would be involved with the project. The identification of unavoidable impacts and the extent to which the action makes use of non-renewable resources, or irreversibly curtails the range of potential uses of the environment is also addressed.

As is applicable to any new development, construction of the Regional WRF improvements will involve the irretrievable loss of certain natural resources such as fossil fuels and building materials. However, the consumption of these resources would not result in an adverse impact to the Island of Kaua'i or the State of Hawai'i. Some of the materials are expected to be imported from other areas outside the Island of Kaua'i. In addition, the loss of these resources would be offset to a certain degree by the new short-term construction jobs created and permanent full-time jobs needed to operate the treatment facility. There would also be some fiscal and economic benefits to the County and State resulting from the project as discussed in other sections.

The most obvious commitment of other resources will be the use of some vacant land for the sewer collection system. Most of the collection system route is planned to go through undeveloped areas generally along roadways or established utility corridors. The intent for this was to minimize impacts on existing uses, thus, the planning for the routes identified presently vacant areas in consultation with landowners. These affected portions of land will hence have its present use altered from the current undeveloped condition.

As discussed throughout the several sections of this document, development of the project will inevitably result in the irreversible removal of certain resources. Portions of the environment associated with affected properties will also have the range of potential uses irreversibly curtailed. However, providing a regional wastewater treatment facility and collection system for this area of the island will provide both community and environmental benefits. As previously discussed, the improvements will not adversely impact the future planned use of affected properties because project plans have been coordinated with property owners who are supportive of this project.

7.4. PROBABLE ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

This section identifies all probable adverse environmental effects that cannot be avoided. The rationale for proceeding with a proposed action, notwithstanding unavoidable effects, is also discussed in this section, if applicable.

As with any new development, the existing environment will be altered to a certain extent due to construction activities for proposed improvements even after implementation of pertinent mitigation measures. The various sections of this document have addressed pertinent environmental impacts associated with development of the proposed Regional WRF Project. Based upon these study results, there are no adverse environmental impacts currently identified which can not be avoided.

7.5. SUMMARY OF UNRESOLVED ISSUES

This section summarizes any unresolved issues associated with the project. If applicable, it addresses how such issues will be resolved prior to commencement of the action, or what overriding reasons there are for proceeding without resolving the problems.

There are no unresolved issues associated with the improvements planned as part of the Regional WRF Project. This document discusses the probably impacts associated with the project and identifies mitigative measures as appropriate. Several of the impacts would be associated with short-term construction related activities that will be mitigated by compliance with applicable ministerial permits and agency conditions as part of the design phase.

8. PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT EIS

Consultation with various government agencies and community organizations has been conducted for this project as part of the pre-assessment consultation process and EIS Preparation Notice process. These consultation efforts are discussed.

8.1. Pre-Assessment Consultation

The following agencies and organizations were consulted during the pre-assessment phase implemented in preparing the EISPN. This consultation also assisted in evaluating potential project impacts and determining the need to prepare an Environmental Impact Statement. The following agencies and organizations were consulted during the pre-assessment phase which was documented in the EISPN.

In addition, the following meetings were held to solicit input on the proposed Project: a Kōloa Town Wastewater meeting held on November 1, 2007; a Kōloa Community Association Board/Malama Mahaulepu Board meeting held on December 6, 2007; and a Kōloa Community Association General Membership meeting held on January 17, 2008.

State of Hawai'i

Department of Business, Economic Development and Tourism, Land Use Commission
Department of Health

County of Kaua'i

Planning Department

Organizations and Interested Parties

Kōloa Community Association
Malama Mahaulepu Board
Grove Farm Company, Inc.
Eric A. Knudsen Trust

8.2. EIS Preparation Notice Consultation

An EISPN dated October 2008 was published in the November 8, 2008 issue of *The Environmental Notice* by the State Office of Environmental Quality Control. The 30-day comment period for that EISPN document ended on December 8, 2008.

Below is a listing of various parties who were distributed a copy of the EISPN for review and comments. Several written comments were received, and are identified with a “➤” below. A total of 12 comment letters were received. Of those who formally replied, some had no comments while others provided substantive. Copies of comment letters received and responses to them are included in Appendix A of this document.

Federal Agencies

- U.S. Army Corps of Engineers
- U.S. Geological Survey
- U.S. Fish and Wildlife Service
- U.S. Natural Resources Conservation Service
- U.S. Environmental Protection Agency, Region IX

State of Hawai'i

- Department of Agriculture
- Department of Business, Economic Development and Tourism (DBEDT)
- DBEDT, Land Use Commission
- DBEDT, Office of Planning
- DBEDT, Energy, Resources and Technology Division
- Department of Health (DOH)
- DOH, Office of Environmental Quality Control
- DOH, Environmental Health Services (Kaua'i Office)
- Department of Land and Natural Resources (DLNR)
- DLNR, Commission on Water Resource Management
- DLNR, Division of Aquatic Resources
- DLNR, Historic Preservation Division
- Office of Hawaiian Affairs
- University of Hawai'i (UH) Environmental Center
- UH Water Resources Research Center
- UH Institute of Marine Biology

County of Kaua'i

- Office of the Mayor
- Office of the County Clerk
- Planning Department
- Department of Public Works, Engineering Division
- Department of Public Works, Division of Wastewater Management
- Department of Public Works, Building Division
- Department of Public Works, Division of Solid Waste Management
- Department of Water
- Fire Department
- Police Department

Utility Agencies

- Kaua'i Island Utility Cooperative
- Hawaiian Telcom
- Oceanic Time Warner Cable of Hawai'i

Organizations and Interested Parties

- Kōloa Community Association
- Malama Mahaulepu
- Po'ipu Beach Resort Association
- Grove Farm Company, Inc.
- Kōloa/Public School Library

8.3. Community Informational Meetings

This section discusses community informational meetings held by the Applicant (HOH Utilities, LLC) during the pre-assessment consultation process to brief the community of the project.

Kōloa Community Association Board of Directors/Malama Mahulepu Board Meeting

A meeting was on December 6, 2007 at the Kōloa Community Association (KCA) Board/Malama Mahaulepu Board Meeting to present the proposed project and obtain comments. A copy of the attendance sheet from this meeting is provided in Appendix A. General comments received are grouped into a few categories which are summarized below along with discussions as to how they are being addressed.

General comments and questions were made about the service area the proposed project would encompass. Specifically, it was asked if the County park (Po'ipū Beach Park), the Sheraton Kaua'i Resort development, the Kukui'ula development, and Grand Hyatt Kaua'i would be included in the service area. The applicant responded that the County park, Sheraton Kaua'i Resort, and Kukui'ula developments would be included in the service area. As for the Grand Hyatt Kaua'i, they have had discussions with them. There were also concerns that people would be forced to connect to the WWRF. The Applicant clarified that since the Regional WRF Project would be a private system, they would not have to connect to this system unless they wanted to.

There were general questions and comments in regards to the treatment process and the operational activities of the pump stations and the Regional WWRF. Questions received are as follows:

- Where does the excess effluent that the Kiahuna Golf Course cannot store go?
Response: The Applicant does not manage the effluent once it leaves the existing Po'ipū WWRF, and they have never seen the reservoir near the golf course full. However, they were installing an injection well to handle the non-R-1 quality effluent and can possible use it to dispose of excess effluent if found necessary.
- Is "large debris" the poop that does not dissolve?

Response: "Large debris" does not refer to poop, but rather included plastic materials, etc. removed from the headworks system to prevent damage to the equipment. It is then bagged and disposed of at the landfill. The Applicant invited those who were interested to visit the existing PWRF to better understand the treatment process.

- Is the water that leaves the UV disinfection system R-1 quality?

Response: Water the leaves the UV disinfection system is R-1 quality.

- How many more generators will be required to pump wastewater uphill for this system?

Response: The Applicant would need to coordinate with Kaua'i Island Utility Cooperative to determine the specifics.

- How many truckloads of waste would be transported from the Regional WRF?

Response: An estimated amount was not known at that time since it would be based upon actual flows occurring. The existing Po'ipū WRF has waste trucked from the facility twice a week based on a 0.5 mgd treatment capacity.

- How many days can the WWRF be down during a disaster?

Response: The Regional WWRF would be designed in consideration of earthquake and seismic zones. In regards to hurricane events, Aqua Engineers has 10 to 12 wastewater facilities under their control and no problems were encountered during the last couple of hurricanes. Also, DOH regulations require that standby power be provided for emergency situations and at a minimum, primary treatment would need to be provided.

- How much it would cost to run a days worth of sewer out of the County parks since the cost will eventually be passed to the public?

Response: The Applicant did not have a cost estimate, but stated that they are working on having everyone pay their fair share. They mentioned that there are different ways to set the rates, and there is also a calculated factor involved.

- What measures will be taken to prevent failure of the WWRF?

Response: To prevent the failure of the WWRF, there will be a backup generator as well as portable pumps.

- One person commented that effluent water generated by the WWRF can probably be piped to Po'ipū Beach Park for use of the showers.

Response: The Applicant noted that a similar technology is used at the Schofield WWTP for drinking water, etc. However, such plans would need to be coordinated with and approved by the County.

- There were general comments and questions associated with site selection. Specifically, it was asked what the attraction was to using the former Kōloa Mill Site and if Grove Farm does not agree with the use of the Kōloa Mill site, are there any other sites being considered?

Response: The Applicant responded the site is an existing industrial use and the infrastructure is already in place. The existing bagasse building was offered for use which will help to save on expenses and there is also an

existing irrigation system that the Regional WWRF can tie into. They were close to reaching an agreement with Grove Farm for the use of the Mill site, but other sites could be considered if the agreement falls through. The Kōloa Mill site was a good idea especially since the existing building can be re-used.

- It was asked how committed HOH was to the Kōloa Creekside force main and where would they locate the WWPS if not at Kōloa Creekside?

Response: The Applicant stated that they were committed to serving Kōloa Town, but the Kōloa WWPS can be relocated from Kōloa Creekside since there are other options such as locating it near the State's housing site. It was also discussed that the WWPS would need to be at low elevation for gravity flow.

- Questions were raised about odor control. Some mentioned that the existing PWRP continued to smell even with the new improvements.

Response: The Po'ipū WRF was never designed with odor control, but the Phase 3 upgrades to the facility will include odor control. Also, the headworks and solids treatment components are the two key components of the treatment plant that are potential odor generators. Therefore, the headworks will be housed in a building wherein air is drawn out and treated. The solids treatment will also be housed in a building wherein 10 to 12 air changes will occur per hour, and will go through a carbon system treatment process before being released. The Regional WRF will be housed in a self-contained building where odor can be controlled versus an open facility where it is harder to control odor.

- It was asked how many injection wells are in use and how many will be taken out of service due to the proposed project.

Response: There are about 16 existing wastewater systems in the proposed service area, and there are about one (1) to two (2) injection wells per facility. Removal from service will be based on the timing of these users connecting to the Regional WRF and their plans for phasing out their injection wells.

Kōloa Community Association General Membership Meeting

Another meeting was held on January 17, 2008 at the Kōloa Community Association's General Membership Meeting to present the proposed project and obtain comments. A copy of the attendance sheet from this meeting is provided in Appendix A.

Comments and questions revolved around some community sentiment to preserve the main buildings at the Kōloa Mill site. There were also concerns about some hazardous waste clean-up issues at the site. Also, the future use of the Mill site was in question.

The bagasse building involves adaptive re-use, and the other mill structures would not be affected by this project. The Applicant responded that the site is zoned Agricultural District, so any industrial uses would have to receive permit approvals from the Planning Commission. Necessary Phase 1 ESA studies would be conducted of the project site. It was suggested that

one possible use for the mill site could be a light industrial area, however, that would be up to the landowner to decide future uses.

Po'ipū Beach Association and Rotary Club of Po'ipū Beach

Two other meetings were held with community organizations in Po'ipū. One was held on October 9, 2008 with the Po'ipū Beach Association and the other on November 11, 2008 with the Rotary Club of Po'ipū Beach.

The purpose for the meetings was to present the project to these associations. Both associations were supportive of the project, and no major issues or concerns were raised.

9. LISTING OF DRAFT EIS PREPARERS

The Draft EIS for the Kōloa-Po'ipū Regional Wastewater Reclamation Facility Project was prepared for HOH Utilities, LLC by Wilson Okamoto Corporation. The following list identifies those individuals and consultants involved in the preparation of this Draft EIS.

Wilson Okamoto Corporation

Ronald A. Sato, AICP	Project Manager and Principal Author
Frances Yamada	Contributing Author
Lauren Yasaka	Contributing Author
Yukino Tanaka	Geographic Information System and Graphics Design

Technical Consultants

<u>Technical Discipline</u>	<u>Consultant</u>
Air Quality	B.D. Neal & Associates
Archaeology	Cultural Surveys Hawai'i, Inc.
Aquatic Biology & Water Quality	AECOS, Inc.
Avifaunal & Mammals	Rana Biological Consultants, Inc.
Botanical Resources	AECOS Consultants
Cultural Resources	Cultural Surveys Hawai'i, Inc.
Hazardous Materials	Myounghee Noh & Associates, Inc.
Historic Architecture	Mason Architects, Inc.
Invertebrate Resources	Rana Biological Consultants, Inc.
Noise	Darby & Associates

10. REFERENCES

- Austin, Tsutsumi & Associates, Inc. *Draft Kōloa-Po'ipū Regional Wastewater Reclamation Facility Basis of Design, Kōloa, Kaua'i, Hawai'i*. Prepared for HOH Utilities, LLC, December 28, 2007.
- Baker, H.L. et al. *Detailed Land Classification, Island of Kaua'i*. L.S. Land Study Bureau, University of Hawai'i. 1965.
- Charlier. April 2007. *Kōloa-Po'ipū Area Circulation Plan*
- County of Kaua'i (County). (2000, November). *Kaua'i General Plan*. Planning Department. Lihue, Hawai'i: Author.
- County of Kaua'i. (2008, June). *Comprehensive Zoning Ordinance*. Planning Department. Lihue, Hawai'i: Author.
- County of Kaua'i, Department of Water. *Water Plan 2020*. Approved by the Water Board, March 21, 2001. Available at: http://www.Kaua'iwater.org/ce_waterplan2020app.asp.
- Engineering Concepts, Inc. *Technical Memorandum, Kōloa Regional Wastewater Transmission System Preliminary Basis-of-Design*. Prepared for Aqua Engineers, December 2007.
- Federal Emergency Management Agency (FEMA). 1993. *Hazard Mitigation Report, Hurricane Iniki*. In Response to the September 12, 1992 Federal Disaster Declaration. FEMA-961-DR-HI. San Francisco, California.
- Fletcher, Charles H., Grossman, Eric E., Richmond, Bruce M., and Gibbs, Ann E. January 2002. *Atlas of Natural Hazards in the Hawaiian Coastal Zone*. U.S. Department of the Interior, Geological Survey (USGS). Prepared in cooperation with University of Hawai'i, State Office of Planning, and National Oceanic and Atmospheric Administration.
- Land Study Bureau, University of Hawai'i. 1967. *Detailed Land Classification – Island of Kaua'i*. Hawai'i.
- Macdonald, Gordon A., Abbott, Agatin T., and Peterson, Frank L. 1983. *Volcanoes in the Sea, The Geology of Hawai'i*. Second Edition. University of Hawai'i Press. Honolulu, Hawai'i.
- National Ocean and Atmospheric Administration (NOAA), National Weather Service Forecast Office, Honolulu, Hawai'i, *Hawai'i State Climate Narrative*. Available at: http://www5.ncdc.noaa.gov/climatenormals/clim60/states/Clim_HI_01.pdf

PBR Hawai'i. *Village at Po'ipū Final Environmental Impact Statement*. Prepared for: Accepting Authority, State of Hawai'i Land Use Commission Docket No. A05-761, Eric A. Knudsen Trust, November 2006.

State of Hawai'i, Department of Agriculture. 1977. *Agricultural Lands of Importance to the State of Hawai'i, Island of Kaua'i*. Hawai'i.

State of Hawai'i, Department of Business, Economic Development and Tourism, Office of Planning. Hawai'i State GIS Program website. Available at:
<http://www.state.hi.us/dbedt/gis/download.htm>.

State of Hawai'i, Department of Land and Natural Resources, Commission on Water Resource Management. "Ground Water Hydrologic Unit Map – Island of Kaua'i," Updated 10/12/1995. Available at: <http://www.state.hi.us/dlnr/cwrm/data/gwKaua'i.pdf>.

State of Hawai'i. 2004. Hawai'i Administrative Rules. Title 11, Department of Health, Chapter 54, Water Quality Standards.

State of Hawai'i. 1998. Hawai'i Revised Statutes. Chapter 343, Environmental Impact Statements.

State of Hawai'i, Department of Education. *Kapaa Elementary School Status and Improvement Report for School Year 2006 – 2007*. March 2008. Available at:
<http://arch.k12.hi.us/PDFs/ssir/2007/Kaua'i/SSIR454-7.pdf> Website accessed May 18, 2009.

State of Hawai'i, Department of Health. October 2008. *Annual Summary of the 2007 Hawai'i Air Quality Data*. Honolulu, Hawai'i.

Stearns, Harold T. *Geology of the State of Hawai'i, Second Edition*. 1985.

University of Hawai'i Land Study Bureau. *Detailed Land Classification – Island of Kaua'i*. November 1965.

U.S. Census Bureau. American FactFinder. Available at:
http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000_SF1_U&lang=en&ts=132868548158 Website accessed May 18, 2009.

U.S. Department of Agriculture Soil Conservation Service (SCS). August 1972. *The Soil Survey of the Islands of Kaua'i, Oahu, Maui, Molokai and Lanai, State of Hawai'i*.

APPENDICES

Appendix A

EISPN Consultation Letters and Response Letters

and

Community Meeting Attendees



United States Department of the Interior

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



In Reply Refer To:
2009-TA-0027

Mr. Ronald A. Sato
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826



DEC 05 2008

Subject: Environmental Impact Preparation Notice for the Koloa-Poipu Regional Wastewater Reclamation Facility, Kauai

Dear Mr. Okamoto:

We received your letter on November 6, 2008, requesting assistance for the preparation of an Environmental Impact Statement for the construction and maintenance of the proposed Koloa-Poipu Regional Wastewater Reclamation Facility (WRF). The WRF will be located on the south shore of Kauai on a 3-acre parcel within a portion of the former Koloa Mill site. The wastewater collection system will have three components consisting of new sewer lines, pump stations, and force mains originating from Koloa Town, Poipu, and Eastern Poipu. The WRF will use an aerobic secondary process and an aerobic sludge stabilization process to treat the wastewater. Dewatering of the aerobically digested sludge will be undertaken through mechanical means. In a conversation held on November 12, 2008, between you and Megan Laut of our office, you indicated that the plans for the WRF are not finalized, but the preferred treatment method would have all facilities contained indoors. We provide the information below to assist you in finalizing the design of the WRF.

We have reviewed the information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program and the Hawaii GAP Program. The federally endangered Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*), Hawaiian common moorhen (*Gallinula chloropus sandvicensis*), Hawaiian stilt (*Himantopus mexicanus knudseni*) (collectively referred to as waterbirds), Hawaiian goose (*Branta sandvicensis*), and Hawaiian hoary bat (*Lasiurus cinereus semotus*), have been observed in the vicinity of the proposed project. The federally threatened Newell's shearwater (*Puffinus auricularis newelli*) and the federally endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) (collectively referred to as seabirds) have been observed flying in and around the vicinity of the proposed project. Additionally, the endangered Kauai cave wolf spider (*Adelocosa anops*) and the Kauai cave amphipod (*Spelaeorchestia koloana*) may also occur in the proposed project area. We have determined that there is no federally designated critical habitat in the project vicinity.



Mr. Ronald A. Sato

2

General Recommendations

We recommend conducting biological surveys to determine the current status and distribution of listed species within the project site as this information will assist you in determining avoidance and minimization measures for these species and their habitats. In addition, we have attached recommend applicable measures identified in the enclosed list of Standard Best Management Practices (BMPs) for fish and wildlife to assist you in project planning.

We offer the following recommendations to minimize impacts to listed waterbirds. If the final project design for the WRF is indoors, impacts may be discountable. If the final design includes open ponds, listed waterbirds will likely be attracted to the site, and we recommend this action should be coordinated with our office so that listed waterbirds are not impacted by the operation of the project. Additional items to consider as part of your proposed project description to minimize effects to waterbirds include:

- If birds are attracted to the area, predator control for rats, cats, dogs and mongooses should be implemented.
- If birds have been observed on a regular basis, surveys for nests must be conducted prior to dewatering or vegetation thinning in the area. Surveys for nests must be conducted by a qualified biologist familiar with the species.
- If a nest is found, all work should cease within a minimum radius of 100 feet of the nest and the Service shall be contacted within 24 hours.

One of the greatest impacts to listed seabirds is artificial night lighting. Seabirds are attracted to artificial lights and they fly around the light source until they either collide with a tall object such as an adjacent building, light pole, wire, or fall to the ground from exhaustion. Once grounded, they are vulnerable to predators or often struck by vehicles along roadways. We suggest the following minimization activities:

- Shield lights in the project footprint.
- Use motion-controlled lights as safety allows.
- Use downward-facing, shielded lights for night work throughout the construction period.
- Cease night work during the seabird fledging season from October 1 through December 15.
- Provide information about seabird fallout to all staff working on site prior to the initiation of work.

If you would like further assistance in developing minimization measures for federally listed species or critical habitats, please contact our office for further assistance. Please contact

Mr. Ronald A. Sato

3

If you would like further assistance in developing minimization measures for federally listed species or critical habitats, please contact our office for further assistance. Please contact Consultation and Technical Assistance Program Fish and Wildlife Biologist Megan Laut (phone: 808-792-9400; fax: 808-792-9581).

Sincerely,

Christa Ressee
for Patrick Leonard
Field Supervisor

Enclosure

Mr. Ronald A. Sato

4

Recommended Best Management Practices (BMPs) and Conservation Measures¹

Hazard Analysis and Critical Control Point

- The project applicant should prepare and implement a Hazard Analysis and Critical Control Point (HACCP) plan to address potential project activities that present risks of introducing non-native invasive species, spillage of chemicals, and accumulation of waste and debris. HACCP plans are used to avoid and minimize risks posed by an activity pathway. The conceptual risk assessment and risk management process used in HACCP will provide for the implementation of control measures to enhance the sanitation of an activity (such as trash or debris disposal; prevention of non-native species introductions and attraction of non-native pests; and proper removal of pollutants, soils, and harmful materials). These sanitation techniques are applied to people, supplies, and equipment to protect the project site, other project sites, and adjacent areas. HACCP plans also include a monitoring component to ensure the desired result is achieved through the implementation of control measures. Helpful information, example plans, and a web-based tool for HACCP plan development are available at the National HACCP website (<http://www.haccp-nrm.org/>).

Habitat

- Adjacent habitat, that is not to be impacted, will be temporarily delineated by orange construction fencing to keep personnel and equipment from damaging the habitat. Signs will be posted indicating that no one is allowed past that boundary. All signs and temporary fencing will be removed from the site after completion of the project.
- No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.), beaches, or other locations where they could be washed into the water from adverse weather or tidal conditions.
- All debris removed from the environment will be disposed of at an approved upland landfill site.
- Dredging/filling in the marine environment will be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.
- Dredging and filling in the marine/aquatic environment will be designed to avoid or minimize the loss special aquatic site habitat (beaches, coral reefs, wetlands, etc.) and the unavoidable loss of such habitat will be offset.

¹ These are general recommendations and all actions may not be appropriate for each project. Additional BMPs and conservation measures will be necessary for individual projects to achieve appropriate avoidance and minimization of affects to species protected under the Endangered Species Act of 1973, as amended.

Erosion Control

- The project proponent will prepare and implement an erosion control and restoration plan to control short-term and long-term effects of erosion and sedimentation. The plan will include all the necessary local jurisdiction requirements regarding erosion control and will implement BMPs for erosion and sediment control as required.
- All vehicle parking will be restricted to previously determined areas or existing roads. Vehicles belonging to the biological monitors and construction supervisors will be parked at the nearest point on existing access roads.
- Erosion control matting or blankets will be secured over top of sloped areas where erosion is likely. Appropriate vegetation will be planted to further secure the area from erosion.
- Erosion control devices will be monitored on a weekly basis and augmented as necessary if new erosion points are discovered. In the event of pending storms, erosion control devices will be inspected to ensure that such devices are in place and are functional. If erosion control devices are found to be non-functional, they will be fixed within 24 hours. Monitoring and maintenance of erosion control devices and adjacent disturbed areas will continue during and immediately after significant storm events.
- The stockpiling of any materials, during project implementation, will be located a minimum of 50 meters (150 feet) away from buffer zones or areas of potential runoff. Prior to the onset of precipitation all stockpiles will be removed or covered and protected with soil stabilization measures, such as a temporary perimeter sediment barrier.
- Stockpiles of "cold mix" asphalt materials will be placed on and covered with plastic or comparable material prior to the onset of precipitation.
- Permanent BMPs for long-term erosion prevention and sediment control will be developed and implemented.
- Turbidity and siltation from project-related work will be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- Any under-layer fills used in the project will be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
- Any soil exposed near water as part of the project will be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

Spill Prevention and Clean Up

- The project applicant will prepare a spill prevention and clean-up plan. Spill control BMPs will be implemented anytime chemicals and/or hazardous substances are stored or used on the projects. Employees shall be educated in proper material handling, spill prevention, and clean-up. Clean-up materials shall be on-site and located near material storage and use.
- Fueling or repair of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate the clean-up of accidental petroleum releases. We suggest that consideration be given to the development of a HACCP plan for this activity (<http://www.haccp-nrm.org/>).
- If refueling is to occur on the project site, dedicated fueling areas should be established and re-fueling practices defined in the spill prevention plan. Dedicated refueling areas will be located at least 50 meters (150 feet) from any buffer zones, aquatic habitats, or habitats supporting listed species. The fueling areas will have signs posted designating the area and listing BMPs for refueling of vehicles and equipment. Drip pans or absorbent pads will be used during on-site vehicle and equipment fueling.

Invasive Species Prevention and Control

- A litter control program shall be instituted at the entire project site. All workers ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project area are deposited in covered or closed trash containers. The trash containers shall be removed from the project area at the end of each working day.

Worker Education

- All BMPs and conservation measures will be reviewed with all workers and made available on the project site. This includes species and habitat specific measures, the erosion control plan, spill prevention and control plan, or the HACCP plan.
- Upon completion of all worker education described above, workers will sign a form stating that they attend the training and understand and will implement all the conservation measures and protection measures. Training shall be conducted in languages other than English, as appropriate.



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www.wilsonokamoto.com

6607-40
August 1, 2009

Mr. Patrick Leonard, Field Supervisor
Pacific Islands Fish and Wildlife Office
Fish and Wildlife Service
United States Department of the Interior
300 Ala Moana Blvd., Room 3-122
Honolulu, HI 96850

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu
Regional Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Leonard:

Thank you for your letter dated December 5, 2008 (2009-TA-0027). We offer the following responses in the respective order of each Division's comment.

1. Thank you for the information on Federally endangered and threatened species that may be occurring in the general vicinity of the project. A biological study will be conducted to identify the presence of any of these species within the project area, and necessary mitigative measures identified. This study will also address possible impacts to invertebrate species noted. We confirm that the project improvements are not located within federally designated critical habitat.
2. Under your general recommendations, we confirm that a biological survey will be conducted for this project. Thank you for providing the information on standard best management practices which will be incorporated into the project design as applicable.
3. This project will include an infiltration basin that could attract waterbirds similar to ponds and detention basins at golf course in this region. Recommendations listed to minimize effects on waterbirds will be incorporated into the design phase of this project as applicable.
4. The recommended minimization measures associated with artificial night lighting will also be addressed in the Draft EIS. The Applicant appreciates the information provided and will coordinate with your agency in addressing implementation of the various measures during the project's design.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton - HOH Utilities, LLC

United States Department of Agriculture



Natural Resources Conservation Service
P. O. Box 50004
Honolulu, Hawaii 96850
(808) 541-2600

January 7, 2009

Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii, 96826
Attn: Ronald A. Sato, AICP

RECEIVED
JAN 12 2009
WILSON OKAMOTO CORPORATION

Thank you for providing the NRCS the opportunity to review the Environmental Assessment and Environmental Impact Statement Preparation Notice for the Koloa-Poipu Regional Wastewater Reclamation Facility Project. Please find enclosed an NRCS Soil Survey Map, Important Farmlands Map, and Soil Reports. Both Prime and Statewide Important Farmlands exist within the project area. The Important Farmland information/map has been enclosed for your aid in determining if a Farmland Impact Conversion Rating Form (AD-1006) is needed for this project. This form is required on projects that convert farmlands into non-farmland uses and have federal dollars attached to the project. See the website link below for more information on the Farmland Protection Policy Act, and a copy of the AD-1006 form with instructions. No hydric soils are located in the project area. Hydric soils identify potential areas of wetlands. If wetlands do exist, any proposed impacts to these wetlands would need to demonstrate compliance with the "Clean Water Act", and may need an Army Corps of Engineers 404 permit.

The NRCS Soil Survey Map identifies the soil map units in the project area. The soil reports provide selected soil properties and interpretations, e.g., Small Commercial Buildings, Engineering Properties including soil layers with USDA Textures, and Engineering Classifications. The limitation ratings for the selected uses e.g. Small Commercial Buildings and Local Roads and Streets are Severe and Very Limited respectively. These ratings do not preclude the intended land use, however they do identify potential limitations for the use, which may require corrective measures, increase costs, and/or require continued maintenance.

The NRCS Soil Survey is a general planning tool and does not eliminate the need for an onsite investigation. If you have any questions concerning the soils or interpretations for this project please call, Tony Rolfe, Assistant State Soil Scientist, (808) 541-2600 Ext.129, or email, Tony.Rolfes@hi.usda.gov.

NRCS - Farmland Protection Policy Act Website: <http://www.nrcs.usda.gov/programs/fppa/>

Lawrence T. Yamamoto
Director
Pacific Islands Area

Cc

Michael Robotham
Ian Costa, Director, County of Kaua'i Planning Department
Ian Kagimoto P. E. HOH Utilities, LLC

Enclosures:

Helping People Help the Land
An Equal Opportunity Provider and Employer

Engineering Properties

Island of Kauai, Hawaii

Map symbol and soil name	Depth	USDA texture	Classification		Fragments			Percent passing sieve number--					Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200				
Fd: Fill land	0-12	Silty clay, Silty clay loam	MH	A-7	0-5	0-5	95-100	95-100	90-100	85-95	50-65	10-20		
	12-30	Silty clay, Silty clay loam, Silt loam	MH, OH	A-7	0-5	0-5	95-100	95-100	90-100	85-95	50-60	10-20		
	30-40	Bedrock	---	---	0	0	0	0	0	0	0	NP		
K/B: Koloa, stony	0-7	Stony silty clay	MH-K (propose d)	A-7	10-20	5-10	90-100	90-100	80-100	80-95	50-60	20-25		
	7-20	Stony silty clay	MH-K (propose d)	A-7	10-30	10-15	90-100	90-100	80-100	80-95	50-60	20-25		
	20-60	Bedrock	---	---	0	0	0	0	0	0	0	NP		
K/C: Koloa, stony	0-7	Stony silty clay	MH-K (propose d)	A-7	10-20	5-10	90-100	90-100	80-100	80-95	50-60	20-25		
	7-20	Stony silty clay	MH-K (propose d)	A-7	10-30	10-15	90-100	90-100	80-100	80-95	50-60	20-25		
	20-60	Bedrock	---	---	0	0	0	0	0	0	0	NP		
K/D: Koloa, stony	0-7	Stony silty clay	MH-K (propose d)	A-7	10-20	5-10	90-100	90-100	80-100	80-95	50-60	20-25		
	7-20	Stony silty clay	MH-K (propose d)	A-7	10-30	10-15	90-100	90-100	80-100	80-95	50-60	20-25		
	20-60	Bedrock	---	---	0	0	0	0	0	0	0	NP		

USDA Natural Resources

Conservation Service

Tabular Data Version: 6
Tabular Data Version Date: 12/31/2006

This report shows only the major soils in each map unit. Others may exist.

Page 1 of 2

Map Unit Legend

Island of Kauai, Hawaii

Map symbol	Map unit name
Fd	Fill land
KvB	Koloa stony silty clay, 3 to 8 percent slopes
KvC	Koloa stony silty clay, 8 to 15 percent slopes
KvD	Koloa stony silty clay, 15 to 25 percent slopes
NnC	Nonopahu clay, 2 to 10 percent slopes
Ws	Waikomo stony silty clay
Wt	Waikomo very rocky silty clay
Wu	Waikomo extremely rocky silty clay

Selected Soil Interpretations

Island of Kauai, Hawaii

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

*This soil interpretation was designed as a "limitation" as opposed to a "suitability". The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation.

Map symbol and soil name	Pct. of map unit	ENG - Shallow Excavations (HI)		ENG - Small Commercial Buildings (HI) *		ENG - Local Roads and Streets *	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Fd: Fill land	100	Severe Bedrock (hard) < 40" depth Unified PT, OH, or OL below 20" (Low strength) Unified PT, OH, or OL below 20" (Excess humus) Flash flooding >= occasional Clay from 40 to 60%	1.00 1.00 1.00 0.50 0.28	Severe Flash flooding > Rare Organic matter (PT, OL or OH) Bedrock (hard) from 20 to 40"	1.00 1.00 0.46	Very limited Flooding Low strength Depth to hard bedrock	1.00 1.00 0.46
KvB: Koloa, stony	100	Severe Bedrock (hard) < 40" depth Clay from 40 to 60% Caving potential is low Fragments (>3") 25 to 50%	1.00 0.28 0.10 0.06	Severe Bedrock (hard) < 20" depth Slopes are from 4 to 8% Fragments (>3") 25 to 50%	0.99 0.50 0.06	Very limited Low strength Depth to hard bedrock Large stones content	1.00 0.99 0.06
KvC: Koloa, stony	100	Severe Bedrock (hard) < 40" depth Slopes 8 to 15% Clay from 40 to 60% Caving potential is low Fragments (>3") 25 to 50%	1.00 0.63 0.28 0.10 0.06	Severe Slopes > 8% Bedrock (hard) < 20" depth Fragments (>3") 25 to 50%	1.00 0.99 0.06	Very limited Low strength Depth to hard bedrock Slope Large stones content	1.00 0.99 0.63 0.06
KvD: Koloa, stony	100	Severe Bedrock (hard) < 40" depth Slopes > 15% Clay from 40 to 60% Caving potential is low Fragments (>3") 25 to 50%	1.00 1.00 0.28 0.10 0.06	Severe Slopes > 8% Bedrock (hard) < 20" depth Fragments (>3") 25 to 50%	1.00 0.99 0.06	Very limited Slope Low strength Depth to hard bedrock Large stones content	1.00 1.00 0.99 0.06

This report shows only the major soils in each map unit. Others may exist.

Engineering Properties

Island of Kauai, Hawaii

Map symbol and soil name	Depth	USDA texture	Classification					Fragments					Liquid limit	Plasticity index
			Unified	AASHTO	Pct >10 Inches	Pct 3-10 Inches	Percent passing sieve number...							
NcC: Nanopeahu	0-17 17-55	Clay Clay, Silty clay	CH	A-7	0	0	95-100	90-100	85-100	80-100	50-95	30-45		
Ws: Waikomo	0-14 14-20 20-30	Stony silty clay Stony silty clay loam Bedrock	MH MH, ML	A-7	20-30 20-30 0	10-20 10-20 0	85-95 85-95 0	80-90 80-90 0	75-90 75-90 0	70-90 70-90 0	50-60 40-60 0	10-20 10-20 NP		
Wt: Waikomo, very rocky	0-14 14-20 20-30	Stony silty clay Stony silty clay loam Bedrock	MH MH, ML	A-7	20-30 20-30 0	10-20 10-20 0	85-95 85-95 0	80-90 80-90 0	75-90 75-90 0	70-90 70-90 0	50-60 40-60 0	10-20 10-20 NP		
Wu: Waikomo, extremely rocky	0-14 14-20 20-30	Stony silty clay Stony silty clay loam Bedrock	MH MH, ML	A-7	20-30 20-30 0	10-20 10-20 0	85-95 85-95 0	80-90 80-90 0	75-90 75-90 0	70-90 70-90 0	50-60 40-60 0	10-20 10-20 NP		
Rock outcrop	0-60	Bedrock	---	---	0	0	0	0	0	0	0	NP		

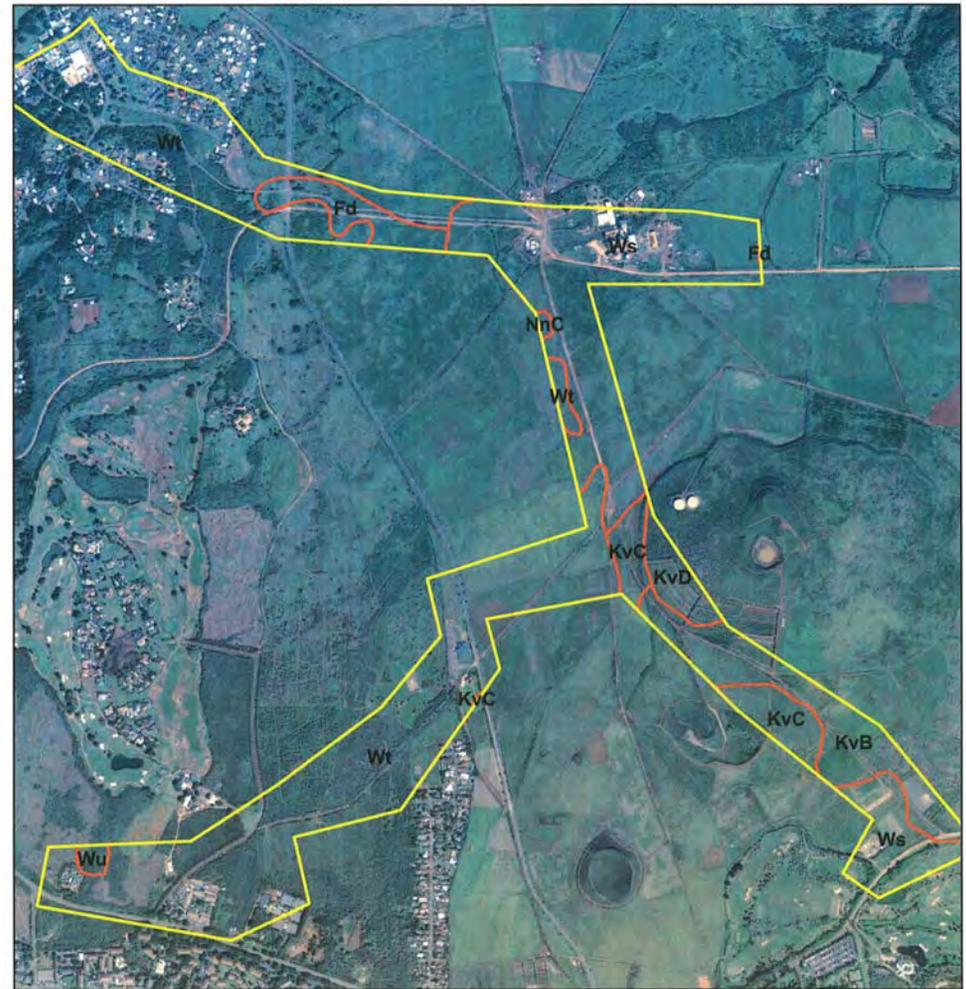
Selected Soil Interpretations

Island of Kauai, Hawaii

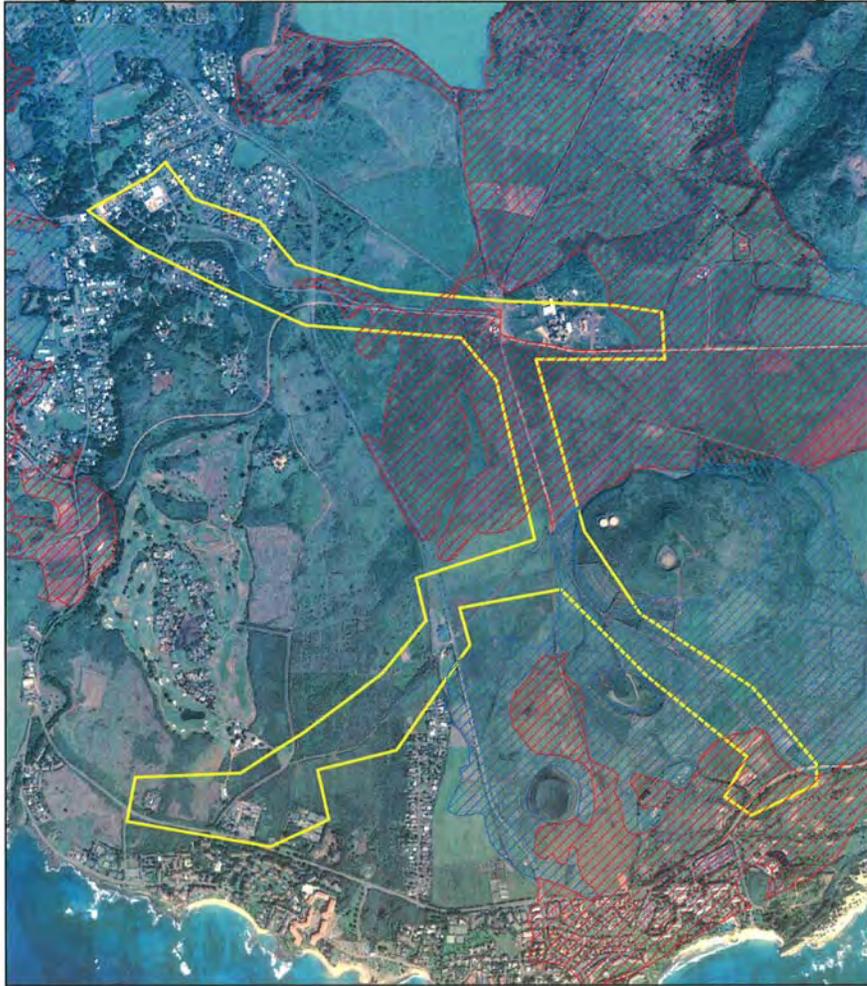
Map symbol and soil name	Pct. of map unit	ENG - Shallow Excavations (HI)		ENG - Small Commercial Buildings (HI) *		ENG - Local Roads and Streets *	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NnC:							
Nonopahu	100	Severe		Severe		Very limited	
		Caving potential	1.00	Shrink-swell (LEP >6)	1.00	Low strength	1.00
		Clay > 60%	1.00	Slopes are from 4 to 8%	0.50	Shrink-swell	1.00
Ws:							
Waikomo	100	Severe		Severe		Very limited	
		Bedrock (hard) < 40" depth	1.00	Bedrock (hard) < 20" depth	0.99	Low strength	1.00
		Fragments (>3") 25 to 50%	0.68	Fragments (>3") 25 to 50%	0.68	Depth to hard bedrock	0.99
		Caving potential is low	0.10	Slopes are from 4 to 8%	0.02	Large stones content	0.68
Wt:							
Waikomo, very rocky	65	Severe		Severe		Very limited	
		Bedrock (hard) < 40" depth	1.00	Bedrock (hard) < 20" depth	0.99	Low strength	1.00
		Fragments (>3") 25 to 50%	0.68	Fragments (>3") 25 to 50%	0.68	Depth to hard bedrock	0.99
		Caving potential is low	0.10	Slopes are from 4 to 8%	0.02	Large stones content	0.68
Rock outcrop							
	35	Severe		Severe		Not rated	
		Bedrock (hard) < 40" depth	1.00	Bedrock (hard) < 20" depth	1.00		
		Caving potential is low	0.10	Slopes are from 4 to 8%	0.02		
Wu:							
Waikomo, extremely rocky	60	Severe		Severe		Very limited	
		Bedrock (hard) < 40" depth	1.00	Bedrock (hard) < 20" depth	0.99	Low strength	1.00
		Fragments (>3") 25 to 50%	0.68	Fragments (>3") 25 to 50%	0.68	Depth to hard bedrock	0.99
		Caving potential is low	0.10	Slopes are from 4 to 8%	0.02	Large stones content	0.68
Rock outcrop							
	40	Severe		Severe		Not rated	
		Bedrock (hard) < 40" depth	1.00	Bedrock (hard) < 20" depth	1.00		
		Caving potential is low	0.10	Slopes are from 4 to 8%	0.02		

This report shows only the major soils in each map unit. Others may exist.

Soils Map for the Koloa-Poipu Regional Wastewater Reclamation Facility Project



Important Farmlands Map for the Koloa-Poipu Regional Wastewater Reclamation Facility Project

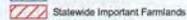


0 900 1,800 3,600 5,400 7,200 Feet

NRCS
1/2009

Legend

Important Farmlands

-  Prime Farmlands
-  Statewide Important Farmlands
-  Unique Farmlands
-  Approx. Project Area



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6607-40
August 1, 2009

Mr. Lawrence T. Yamamoto, Director
Pacific Islands Area
Natural Resources Conservation Service
United States Department of Agriculture
P.O. Box 621
Honolulu, HI 96809

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Yamamoto:

Thank you for your letter dated January 7, 2009. We offer the following responses in the respective order of each comment.

Thank you for the information on soils and farmland. A farmland impact conversion rating assessment should not be required for this project. We also confirm that no hydric soils are present in the project area, and no wetlands will be impacted.

A copy of the Draft EIS will be submitted for your department's review when published. Your letters, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton - HOH Utilities, LLC

LINDA LINGLE
GOVERNOR OF HAWAII



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

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

In reply, please refer to:
EPO-08-158

December 15, 2008



Mr. Ronald A. Sato, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Sato:

SUBJECT: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility
Koloa, Kauai, Hawaii
TMK: (4) 2-8-004: 003 (por.); 13 acres

Thank you for allowing us to review and comment on the subject application. The application was routed to the various branches of the Environmental Health Administration. We have the following Wastewater Branch and General comments.

Wastewater Branch

The document proposes the development of a regional wastewater reclamation facility and collection system in the Koloa-Poipu area within the south shore of Kauai, Hawaii.

The project is located in the Critical Wastewater Disposal Area (CWDA) where no new cesspools will be allowed.

We have no objections to the proposal and offer our recommendation for approval as the domestic wastewater from existing and future developments should be treated at the highest possible level to protect water sources and the environment.

We further encourage the developer to utilize recycled wastewater for irrigation and other non-potable water purposes in open space and landscaping areas.

Mr. Sato
December 15, 2008
Page 2

All wastewater plans must meet Department's Rules, HAR Chapter 11-62, "Wastewater Systems." We do reserve the right to review the detailed wastewater plans for conformance to applicable rules. If you have any questions, please contact the Planning & Design Section of the Wastewater Branch at 586-4294.

General

We strongly recommend that you review all of the Standard Comments on our website: www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this application should be adhered to.

If there are any questions about these comments please contact Jiakai Liu with the Environmental Planning Office at 586-4346.

Sincerely,

KELVIN H. SUNADA, MANAGER
Environmental Planning Office

c: EPO
WWB
EH-Kauai



6607-40
August 1, 2009

Mr. Kelvin H. Sunada, Manager
Environmental Planning Office
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Sunada:

Thank you for your letter dated December 15, 2008. We offer the following responses to your comments.

Wastewater Branch

The project improvements will occur within the critical wastewater disposal area and will allow existing cesspool users within this area to connect to this regional system if they desire.

We note this branch has no objections to the project, and acknowledge its support for project approval because wastewater treated by this project would be the highest level (R-1) protecting water sources and the environment. Recycled wastewater is planned to be used for irrigation and other non-potable water purposes in open space and landscaping areas. All wastewater plans will meet the Department's Rules, HAR Chapter 11-62 (Wastewater Systems).

General

The standard comments on the department's website will be reviewed, and pertinent comments addressed. A copy of the Draft EIS will be submitted for your department's review when published.

Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

If you have any questions, please call me at 808-946-2277 or fax to 808-946-2253.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton - HOH Utilities, LLC



DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12347

December 8, 2008

Mr. Ronald A. Sato, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826



Dear Mr. Sato:

Subject: Environmental Impact Statement Preparation Notice for
Koloa-Poipu Regional Wastewater Reclamation Facility
TMK: (4) 2-08-004: portion of 003, 2-08-008: portion of 001 and 036, 2-
08-009: portion of 001, 2-08-001: portion of 001, 2-08-014: portions of
005, 019, 023, 030, and 037, 2-08-022: portions of 001, 011, 021, and 030,
and 2-09-001: portions of 001 and 002
Koloa, Kauai, Hawaii

Thank you for the opportunity to review and comment upon the Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional Wastewater Reclamation Facility. The Office of Planning has no comments at this time. In so stating, the Office offers no judgment of either the adequacy of the document/application itself or the merits of the proposed project.

If you have any questions, please contact Lorene Maki of our Land Use Division at 587-2888.

Sincerely,

Abbey Seth Mayer
Director

c: Ian Costa, County of Kauai
Ian Kagimoto, HOH Utilities, LLC
Katherine Kealoha, OEQC



6607-40
August 1, 2009

Ms. Abbey Seth Mayer, Director
Office of Planning
Department of Business, Economic Development, and Tourism
State of Hawaii
P.O. Box 2359
Honolulu, HI 96804

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Ms. Mayer:

Thank you for your letter dated December 8, 2008. We acknowledge that you have no comments to offer at this time. A copy of the Draft EIS will be submitted for your department's review when published.

Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton – HOH Utilities, LLC

LINDA LINGLE
GOVERNOR OF HAWAII



LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 2, 2008

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

Attention: Mr. Ronald Sato, AICP

Ladies and Gentlemen:

Subject: Koloa-Poipu Regional Wastewater Reclamation Facility

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 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 587-0433. Thank you.

Sincerely,

Morris M. Atta
Administrator

Cc: OEQC
County of Kauai
HOH Utilities, LLC



LINDA LINGLE
GOVERNOR OF HAWAII



Laura H. Theelen
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 8, 2008

MEMORANDUM

TO: **DLNR Agencies:**
 Div. of Aquatic Resources
 Div. of Boating & Ocean Recreation
 Engineering Division
 Div. of Forestry & Wildlife
 Div. of State Parks
 Commission on Water Resource Management
 Office of Conservation & Coastal Lands
 Land Division -

FROM: *for* Morris M. Atta *Chairman*
SUBJECT: Environmental assessment & environmental impact statement preparation notice for Koloa-Poipu regional Wastewater Reclamation Facility Project
LOCATION: Koloa, Kauai
APPLICANT: Wilson Okamoto Corporation on behalf of HOH Utilities, 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 1, 2008.

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: *Eric T. Hiranano*
Date: 11/19/08

RECEIVED
LAND DIVISION
2008 NOV 19 P 3:17
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LM/MorrisAtta
REF.:EAEISPNKoloaPoipuWasteReclamationFacility
Kauai.71

COMMENTS

- (X) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.
- () 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 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. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
- () Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- () Mr. Mario Antonio at (808) 241-6620 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: *Eric T. Hiranano*
ERIC T. HIRANO, CHIEF ENGINEER

Date: 11/19/08



6607-40
August 1, 2009

Mr. Morris Atta, Administrator
Land Division
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street
Honolulu, HI 96813

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Atta:

Thank you for your letter dated December 2, 2008.

We concur that the treatment facility project site along with the majority of the sewer collection system are located in Zone X according to the Flood Insurance Rate Map (FIRM). The National Flood Insurance Program has no regulations for developments within such zone.

In Kōloa town, there is a short segment that would have a sewer line situated within a flood designated area. This involves a segment extending from Weliweli Road eastbound along a private driveway identified as Yamada Road to service an existing commercial area. This area is designated both Zone X (flood areas with 0.2 percent annual chance flood) and Zone AE. The Draft EIS will address this in more detail.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton – HOH Utilities, LLC



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

LAURA H. THELEN
CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSIONER OF WATER RESOURCES MANAGEMENT
RUSSELL Y. TSUI
FIRST DEPUTY
KEN C. KAWAHARA
DEPUTY DIRECTOR, DW, WATER
JULIA H. BISHOP
DEPUTY DIRECTOR, STATE HISTORIC PRESERVATION
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSIONER OF LAND USE AND PLANNING
COMMISSIONER OF CULTURAL RESOURCES
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIRECTOR AND CHIEF OF HISTORIC PRESERVATION
KATHARINE W. WILSON
DEPUTY DIRECTOR, COMMISSIONER OF LAND
STATE PARKS

November 17, 2008

Mr. Ronald A Sato, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii'i 96826

LOG NO: 2008.5001
DOC NO: 0811W123
Archaeology

Dear Mr. Sato

**SUBJECT: Environmental Assessment and Environmental Impact Statement Preparation
Notice for Koloa-Poipu Regional Wastewater Reclamation Facility Project, Koloa,
Island of Kaua'i
TMK: (4) 2-08 various...(4) 2-09-001: portions of 001**

Thank you for the opportunity to review this Preparation Notice for a Draft Environmental Impact Statement (EIS) for the Koloa-Poipu Regional Wastewater Reclamation Facility Project, which we received on November 6, 2007.

The project area is known to be in an archaeologically sensitive area, therefore, we concur with the finding to perform an Archaeological Inventory Survey to record and document archaeological sites in the area.

Additionally, we concur with your finding to complete a Cultural Impact Assessment (CIA). Please bind the CIA separately for review by the Culture History Division her at SHPD.

Please call Wendy Tolleson at (808) 692-8024 (Archaeology) or Coochie Cayan (Cultural History Branch Chief) if you have any questions or concerns regarding this letter.

Aloha,

Nancy McMahon, Deputy SHPO/State Archaeologist
and Historic Preservation Manager



6607-40
August 1, 2009

Ms. Nancy McMahon, Deputy SHPO/State Archaeologist
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
601 Kamokila Blvd., Room 555
Kapolei, HI 96707

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Ms. McMahon:

Thank you for your letter dated November 17, 2008.

An Archaeological Inventory Survey will be done for the proposed Project and will be included in the Draft EIS. A Cultural Impact Study will also be done for the Project and will be included in the Draft EIS.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EA. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton - HOH Utilities, LLC

PHONE (808) 594-1888



FAX (808) 594-1865

STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPIOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

COUNTY OF KAUAI
103
HRD08/2625B12 P1:47
PLANNING DEPT.

December 1, 2008

County of Kaua'i, Planning Department
4444 Rice Street, Suite 473
Lihu'e, Hawaii'i 96766

RE: Request for comments on the proposed regional wastewater reclamation facility and environmental impact statement preparation notice (EISPN), Kōloa, Kaua'i.

Aloha e County of Kaua'i,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter. OHA has reviewed the project and offers the following comments.

OHA sees that the proposal consists of developing a regional wastewater reclamation facility and collection system. OHA sees potential benefits from this proposal in the form of a better orchestrated approach towards wastewater in this area rather than the piecemeal and detrimental actions we see there now. Additionally we see the potential for increased production and use of R-1 water and subsequent improved water quality due to the related reduced injection well disposal. We are also hopeful that this proposed system will not only allow large capacity cesspool users "the opportunity to connect to the regional system" (EISPN, page 12), but will necessitate that they do so under current Environmental Protection Agency regulations, which will have advantageous effects to water quality in the area.¹

OHA notes that receiving marine waters are categorized as class A and AA (EISPN, page 32). Class A waters have strict pollution discharge regulations to protect them for recreational and aesthetic enjoyment. According to the standards for Class A waters, discharges are not permitted unless they have received the best degree of treatment or control compatible with the established criteria for the receiving water. Class AA waters have regulations against discharge to protect the waters in a natural pristine state with an absolute minimum pollution or alteration of water quality from any human source or action, according to the state Department of Health.

¹ OHA sees that there is no proposal for existing single-family residence to use this proposed system. Cesspools of any size are detrimental and Hawaii'i has a large number of them that should be closed. (EISPN, page 6)

Further, we do note that in addition to the federal requirements, any project and its potential impacts to state waters must meet the following criteria:

-Anti-degradation policy (Hawai'i Administrative Rules (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.

- Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

- Water quality criteria (HAR, Sections 11-54-4 through 11-54-8)

As such, we ask that the draft EIS address these impacts thoroughly and we inquire as to the class of the inland water bodies and marine bottoms in the project area as well.

OHA realizes that a major way in which federal and state agencies address impacts to water quality is through management measures or what the applicant refers to as best management practices (BMPS). OHA urges that it is not enough that the "draft EIS will address such short-term construction-related effects and identify potential BMPS that could be implemented" (EISPN, page 33; see also page 46). BMPS require skillful installation, application and maintenance to be effective. Once implemented, they require monitoring to ensure that they are achieving the objectives for which they were selected. At the heart of BMP effectiveness monitoring is a listing of each BMP, its expected performance and an assessment of whether the controlled value (noise, dust, water quality, etc.) is within targeted limits. OHA asks that the draft EIS address how these BMPs will be assessed to ensure that they are achieving the objectives for which they were selected.

OHA sees that the majority of this area is zoned agriculture and looks undeveloped (figure 2.3). As such, we inquire as to the necessity for such a large scale and comprehensive proposal. When we read that current conditions such as cesspools do not even comply with current regulations, our concerns over such a massive expansion were heightened. We urge that current conditions should be improved before, or along with this proposal. Certainly existing cesspool users should be required to find a suitable alternate wastewater system, either before a proposal such as this or concurrently with it. OHA strongly urges that the applicant coordinate their project with current U.S. Environmental Protection Agency actions in the area concerning cesspools in the area.

OHA is also concerned land use patterns, growth rates and population changes will be induced by this proposal. Because the majority of the project area is zoned agriculture, we ask what rating the soils have and whether or not these are prime agricultural lands. Generally, OHA wishes to see these types of lands remain in only accessory agribusiness activities that meet the

intent of Hawaii Revised Statutes section 205. As such, no future zoning changes should be considered for this area nor be facilitated by the use of this project. We also note that this proposal includes future land uses (EISPN, page 10) and we ask what those are and if they include future golf courses as is a mentioned use of the R-1 water.

OHA would also like to suggest that the project area be landscaped with drought tolerant native or indigenous species that are common to the area as soon as possible after grading. Any invasive species should also be removed. Doing so would not only serve as practical water-saving landscaping practices, but also serve to further the traditional Hawaiian concept of mālama 'āina and create a more Hawaiian sense of place. This would also help to reduce the amount of impervious surfaces in the project area, thereby reducing runoff as well.

Because this project is so close to the coast and Newell's Shearwaters are mentioned in the EISPN (page 35), all outdoor lights should be fully shaded or full cut-off styles. Uplighting should also be avoided. Every effort should be made to avoid lighting situations where light glare projects upwards or laterally. Large, high-intensity floodlights located on building tops or poles should also be avoided. Use of amber colored or other color (such as blue or green) filters or bulbs should be used to assist in decreasing risk of seabird attraction. For the same reasons, OHA also recommends the use of motion detection-activated lights to prevent lights from being on for extended periods of time. Also, the painting of buildings and other facilities should be in earth tones; white or reflecting colors are to be avoided.

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold by phone at (808) 594-0263 or e-mail him at granta@oha.org.

'O wau iho nō me ka 'oia'i'o,



Clyde W. Nāmu'o
Administrator

C: OHA CRC Kaua'i

Kate Rao
Ground Water Office (WTR-9)
USEPA Region 9
75 Hawthorne St., San Francisco, CA 94105



6607-40
August 1, 2009

Mr. Clyde W. Namuo, Administrator
Office of Hawaiian Affairs
State of Hawai'i
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Thank you for your letter dated December 1, 2008. We offer the following responses.

We concur with the State Office of Hawaiian Affairs' comments regarding the potential benefits from a regional wastewater system serving this area rather than the current piecemeal conditions along with the potential reuse benefits of the R-1 quality water. The Applicant cannot force current owners of large capacity cesspools (LCC) to connect to this private wastewater system. But there are already some property owners planned to connect to this system allowing for the elimination of their LCCs. The Applicant is hopeful others will chose to connect to this system and is willing to discuss such plans with other property owners.

We confirm the classification of coastal waters and are aware of the applicable regulations associated with them. The Draft EIS will address these regulations as applicable along with inland surface waters. There are no marine bottoms associated with this project.

The design phase would develop appropriate best management practices (BMP) for implementation which still need to be reviewed and approved by respective government agencies. Therefore, the details of such specifications are not appropriate at this planning stage of the project. The actual measures and methods implemented during construction would be the responsibility of the contractor. Monitoring of BMP measures is an important component which the contractor is responsible for. Thus, the Applicant will consider measures needed during the construction phase to monitor the work by contractors to ensure BMPs are working properly. Such measures may include periodic site inspections by staff engineers or hiring a construction manager to oversee the work by the contractor.

The proposed project would not utilize a large area for the treatment facility and will be utilizing existing structures from the Kōloa Mill further minimizing the area of agricultural land used. The remaining system components consist of the sewer collection system which primarily involves sewer lines along with four wastewater pump stations. The intent for this project is to provide a regional solution for the area instead of allowing continued piecemeal treatment of wastewater by property owner as has been occurring. The Applicant is not responsible for the operation of LCCs, cesspools, or individual packaged treatment plants by other property owners. The Applicant also has no jurisdiction to enforce compliance of regulations with agencies such as the U.S. Environmental Protection Agency. Without a regional system, property owners will continue to treat wastewater on an individual basis. The Draft EIS will have more information discussing the present situation of wastewater treatment in the region.

Land use patterns and growth rates more appropriately fall under the jurisdiction of the County who controls these items through their General Plan and entitlement process. The project would have minimal effect on inducing land use patterns or developments in the area since those decisions are made by landowners based upon other pertinent factors such as economics and market conditions. The Draft EIS will include sections to address this, and provide information

Page 2

on soils for the project area. The project has incorporated available information on future developments planned in the region to appropriately estimate future wastewater flows to plan the regional system and associated collection system. Implementation of those developments will be based upon the respective landowners obtaining necessary approvals from the County. The existing Po'ipū Golf Course is planned for reuse of the R-1 water.

The treatment facility will use existing structures and a portion of the Kōloa Mill. Therefore, project landscaping is not planned as surrounding land uses consists of agricultural lands as compared to a project within a residential community. The sewer collection system would be located underground and not require landscaping.

Any outdoor lighting associated with the treatment facility will be appropriately designed, and will be coordinated with the respective agencies. The suggestion of earth tones for buildings will be considered in the project's design.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton – HOH Utilities, LLC



Water has no substitute.....Conserve it

December 19, 2008

Mr. Ronald Sato
Wilson Okamoto Corporation
1907 S. Beretania Street
Honolulu, HI 96826

Dear Mr. Sato:

Subject: Environmental Impact Statement Preparation Notice (EISPN): Koloa-Poipu Regional Wastewater Reclamation Facility, TMK: 2-8-04: por. 003, 2-8-08: por 001 and 036, 2-8-09: por 001, 2-8-11: por 001, 2-8-14: portions of 005, 019, 023, 030, and 037; 2-8-22: portions of 001, 011, 021, and 030; and 2-9-01: portions of 001 and 002, Koloa, Kauai, Hawaii

This letter is in response to the EISPN dated October 2008, received by the Department of Water (DOW) on November 6, 2008.

The following are the DOW comments to the EISPN for the Koloa-Poipu Regional Wastewater Reclamation Facility Project:

- We understand that the draft EIS will address in more detail the beneficial impacts that the proposed wastewater facility improvements would have on groundwater resources. Please address possible negative impacts on groundwater resources and/or DOW wells that may occur, if any.
- The Koloa Mill site is located above the UIC line. The DOW domestic water wells are located in the area. How will the proposed wastewater facility improvements affect the groundwater resources and the DOW wells?
- Will there be a monitoring system to determine if the groundwater aquifer is being affected and if so, how often will tests be done? What mitigations will occur if it is determined that the groundwater aquifer is being negatively impacted?
- Any actual development will be dependent on the water source, storage, and transmission facilities existing at that time.

If you have any questions, please contact Mr. Keith Aoki at (808) 245-5418.

Sincerely,


Gregg Fujikawa
Chief of Water Resources and Planning

KA:ml
T-10545 Eispn koloa-poipu wwrp 2008

c: Ian Costa, Planning Department
Ian Kagimoto, HOH Utilities, LLC

4398 Pua Loke St., P.O. Box 1706, Lihue, HI 96766 Phone: 808-245-5400
Engineering and Fiscal Fax: 808-245-5813, Operations Fax: 808-245-5402, Administration Fax: 808-246-8628



1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

6607-40
August 1, 2009

Mr. Gregg Fujikawa, Chief
Water Resources and Planning
Department of Water
County of Kaua'i
P.O. Box 1706
Lihue, HI 96766

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Fujikawa:

Thank you for your letter dated December 19, 2008. We offer the following responses to each of the comments noted.

1. The Draft EIS will address beneficial effects on groundwater resources from the project. There are no known County Department of Water wells situated in the immediate vicinity of the project improvements that would be negatively impacted.
2. We confirm the Kōloa Mill site is located above the UIC line. There are now known wells in the immediate vicinity of the treatment plant site at the mill. Thus, the project is not expected to impact County wells and should have a beneficial impact on groundwater resources with the closure of large capacity cesspools in Kōloa Town. The Draft EIS will have further information in this area.
3. There is no monitoring system currently included with the project to determine if the groundwater aquifer is being affected.
4. Development of the treatment facility will be coordinated with your department to determine availability of water source, storage, and transmission facilities.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,



Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton – HOH Utilities, LLC

BERNARD P. CARVALHO, JR.
MAYOR



GARY K. HEU
ADMINISTRATIVE ASSISTANT

AN EQUAL OPPORTUNITY EMPLOYER

COUNTY OF KAUA'I
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MO'IKEHA BUILDING, SUITE 275
LIHU'E, KAUA'I, HAWAII 96766-1340

December 5, 2008

Wilson Okamoto Corporation
1907 S. Beretania Street
Honolulu, Hawaii 96826

Attention: Mr. Ronald A. Sato, AICP

SUBJECT: ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL IMPACT
STATEMENT PREPARATION NOTICE, KŌLOA-POI'PŪ REGIONAL
WASTEWATER RECLAMATION FACILITY PROJECT

We acknowledge receipt of your October 2008 Environmental Impact Statement (EIS) Preparation Notice and Environmental Assessment (EA) for the subject Project. We offer the following general comments for your consideration:

1. The Project is outside of the County's Wastewater Service area, and is part of a proposed private wastewater system to be developed by HOH Utilities, LLC (the "Applicant"). All wastewater system improvements shall be designed and constructed in accordance with the State of Hawai'i Department of Health (DOH) requirements.
2. The County understands that the Project involves development of a wastewater collection system, wastewater pump stations and a new Wastewater Treatment Plant (WWTP) that will work in conjunction with the existing Poi'pū Wastewater Reclamation Facility (Poi'pū WRF) owned by HOH Utilities, LLC. Prior to any building permit approval by the County for existing or proposed commercial or residential connection to areas of the proposed new collection system that will not be connected to the existing Poi'pū WRF, all infrastructure necessary to provide wastewater treatment and disposal, including the new WWTP, shall be completed and in service.
3. The County Department of Public Works plan review and permit requirements are applicable for all work within the public Right-of-Way. All wastewater system improvements within the public Right-of-Way shall comply with all County standards. The Applicant is advised to consult with all applicable State and County agencies, including but not limited to the Public Works Engineering Division, the Planning Department and the DOH regarding their requirements for the proposed Project.

DONALD M. FUJIMOTO
COUNTY ENGINEER
TELEPHONE 241-4992

EDMOND P. K. RENAUD
DEPUTY COUNTY ENGINEER
TELEPHONE 241-4992



Wilson Okamoto Corporation
December 5, 2008
Page 2

4. The County recommends that all improvements should be designed and constructed in a fashion that allows for future extension of the proposed sewer collection system to serve existing and anticipated future residential and commercial properties in the Kōloa – Poi'pū service area. The anticipated future wastewater flows from the community should be identified and documented in a Preliminary Engineering Report (PER) to be submitted for review by the County and approval by the DOH.

Thank you for providing this opportunity for consultation on this pending project. We look forward to receipt of the Draft EIS. If you have any questions, please call Edward Tschupp at (808) 241-6610.

Very truly yours,

EDWARD TSCHUPP
Chief, Wastewater Management Division

CONCUR:

DONALD M. FUJIMOTO
County Engineer

cc: Office of Environmental Quality Control
HOH Utilities, LLC.
Engineering Division
Planning Department



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6607-40
August 1, 2009

Mr. Edward Tschupp, Chief
Wastewater Management Division
County of Kauai
Moikeha Building, Suite 275
4444 Rice Street
Lihue, HI 96766-1340

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu
Regional Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Tschupp:

Thank you for your letter dated December 5, 2008. We offer the following responses in the respective order of each comment.

1. We acknowledge that the Project is outside of the County's Wastewater Service area and that all wastewater system improvement will be designed and constructed in accordance with the State Department of Health (DOH) requirements.
2. We will defer to the County regarding their review and approval of building permits for other developments that may be connecting to this project.
3. All work within the public right-of-way will be subject to the County Department of Public Works plan review and permit requirements. The Applicant has been coordinating with applicable agencies regarding their requirements.
4. The sewer collection system improvements have been planned to service areas that plan to connect, and accommodates future development plans for the area. If other areas of Kōloa Town and Po'ipū would like to connect to this regional system, appropriate planning will be developed by the Applicant at that time. An updated engineering report would be prepared at the appropriate time for agency review.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton – HOH Utilities, LLC

BERNARD P. CARVALHO, JR.
MAYOR

GARY K. HEU
ADMINISTRATIVE ASSISTANT



DONALD M. FUJIMOTO
COUNTY ENGINEER
TELEPHONE 241-4992

EDMOND P.K. RENAUD
DEPUTY COUNTY ENGINEER
TELEPHONE 241-4992

AN EQUAL OPPORTUNITY EMPLOYER

COUNTY OF KAUA'I
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MO'IKEHA BUILDING, SUITE 275
LIHUE, KAUA'I, HAWAII 96766-1340

December 10, 2008



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

Attention: Mr. Ronald A. Sato, AICP

SUBJECT: ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL IMPACT
STATEMENT PREPARATION NOTICE, KŌLOA-PO'IPŪ REGIONAL
WASTEWATER RECLAMATION FACILITY PROJECT PW.11.08.027

Gentlemen,

We reviewed the subject Environmental Assessment and Environmental Impact Statement Preparation Notice for the Kōloa Po'ipū Regional Wastewater Reclamation Facility. We offer the following comments:

1. The project involves the development of a wastewater collection system, wastewater pump stations and a new Wastewater Treatment Plant (WWTP). The wastewater collection system will involve the following roadways:
 - Kōloa Road,
 - Waikomo Road,
 - Weliweli Road, and
 - Ala Kinoiki (Eastern Bypass Road).

We are not sure of the roadway ownership for Weliweli Road between its intersection with Ala Kinoike and the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility. This portion of Weliweli Road originally provided access only to the former Kōloa Mill and we suspect this portion of roadway to be a private roadway. Title search needs to be provided to determine the roadway ownership for section of Weliweli Road.

Utility easements will need to be provided to be located within County roadways. Utility easements **must** be approved by our County Council. The utility operator will need to provide an appraisal of the land value and compensate the County for the utilities (including the R1 Quality Effluent for reuse) to located its utilities within the County Right of Ways.

Wilson Okamoto Corporation
December 10, 2008
Page (2)

2. A Road Permit is required for work within County Right of Ways. Construction plans shall be submitted for our review and approval.
3. Traffic Control Plans shall be incorporated with the Construction Plans for the wastewater collection system. One lane of traffic shall be maintained at all times during construction and all lanes opened to public and pedestrian traffic during non working hours.
4. Best Management Practices (BMP's) shall be provided at all times to the maximum extent practicable to prevent damage by sedimentation, erosion, and dust to streams, water courses, natural areas and the property of others.
5. The coastal waters in the vicinity offshore of the project area are classified as Class AA waters by the State Department of Health (DOH). Class AA waters are high quality coastal waters classified by the DOH with the objective that "these waters remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions."
6. Grading Activities shall comply with the County's Sediment and Erosion Control Ordinance No. 808.

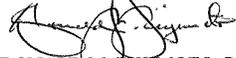
Thank you for this opportunity to provide our comments. Should you have any questions please feel free to contact us. We wish to remain on your list.

Very truly yours,



Wallace Kudo, P.E.
Chief, Engineering Division

CONCUR:



DONALD M. FUJIMOTO, P.E.
County Engineer

WK

cc: Office of Environmental Quality Control
HOH Utilities, LLC
Planning Department
Wastewater Management Division
Design and Permitting
Construction Inspection



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6607-40
August 1, 2009

Mr. Wallace Kudo, P.E., Chief
Engineering Division
Department of Public Works
County of Kauai
Moikeha Building, Suite 275
4444 Rice Street
Lihue, HI 96766-1340

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu
Regional Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Kudo:

Thank you for your letter dated December 10, 2008. We offer the following responses in the respective order of each comment.

1. Our understanding is that the portion of Weliweli Road situated east of its intersection with Ala Kinoiki and extending to the Kōloa Mill is privately owned. Utility easements will be obtained from the County that are located within County roadways. We acknowledge that such easements must be approved by the County Council, and that an appraisal will be required.
2. A road permit will be obtained for work done within County right-of-ways and construction plans will be submitted for your review and approval.
3. Traffic Control Plans will be incorporated within the construction plans and one lane of traffic shall be maintained at all times during construction and all lanes opened to public and pedestrian traffic during non-working hours.
4. The Draft EIS will discuss Best Management Practices (BMPs) that will be implemented during construction activities.
5. We confirm that the coastal waters in the vicinity offshore of the project area are classified as class AA waters by the DOH and will include discussion in the DEIS addressing measures taken to preserve the water quality in the area.
6. Grading activities, as discussed in the DEIS, will comply with the County's Sediment and Erosion Control Ordinance No. 808.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EA. We appreciate your participation during this phase of the process.

Sincerely,



Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton – HOH Utilities, LLC

BILL "KAIPO" ASING
MAYOR

GARY K. HEU
ADMINISTRATIVE ASSISTANT



AN EQUAL OPPORTUNITY EMPLOYER
COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
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LIHU'E, KAUAI, HAWAII 96766-1340

November 28, 2008

Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, HI 96826

SUBJECT: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional
Wastewater Reclamation Facility

Dear Mr. Sato:

We offer the following comments on the flood requirements for the subject Environmental Impact Statement. The project lies within the Flood Insurance Rate Map (FIRM) panels 318E, 314E, and 313E.

The major project facilities are located outside the special flood hazard areas subject to inundation by the 1% annual chance flood. However, the transmission lines and minor facilities may encroach on flood prone areas as defined by the National Flood Insurance Program or as determined in community determined flood and drainage studies. The project needs to be engineered so that flood requirements are met in these areas of encroachment.

Should you have any questions, please contact Mario T. Antonio of my staff at (808)241-4873.

Very truly yours,


DONALD M. FUJIMOTO, P.E.
County Engineer

MTA
Copy to: Planning Department
Wastewater Division

DONALD M. FUJIMOTO
COUNTY ENGINEER
TELEPHONE 241-4992

EDMOND P.K. RENAUD
DEPUTY COUNTY ENGINEER
TELEPHONE 241-4992



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6607-40
August 1, 2009

Mr. Donald Fujimoto, P.E., County Engineer
Department of Public Works
County of Kauai
Moikeha Building, Suite 275
4444 Rice Street
Lihue, HI 96766

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu
Regional Wastewater Reclamation Facility Project
Koloa, Kauai, Hawaii

Dear Mr. Fujimoto:

Thank you for your letter dated November 28, 2008. We acknowledge and shall address in the Draft Environmental Impact Statement that the major project facilities of the proposed project are located outside the special flood hazard areas subject to inundation by the 1% annual change flood, but that the transmission lines and minor facilities may encroach on flood prone areas.

The project improvements will be designed so that flood requirements are met in the areas of encroachment. A copy of the Draft EIS will be submitted for your department's review when published.

Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,



Ronald A. Sato, AICP
Project Manager

cc: Julie Simonton - HOH Utilities, LLC



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PBRA BOARD
 Roy Thompson, President
 Kiahuna Plantation
 Castle Resorts
 Greg Kamn, Vice President
 Emovitus
 Jonathan Panish, Treasurer
 The Parish Collection Kauai
 Doug Sears, Secretary
 Grand Hyatt Kauai Resort & Spa
 Lucy Kawailulu
 Kauai Vacation Rentals
 Noe Hookano
 Lawai Beach Resort
 Steve Yannarell
 Marriott's Waikahi Beach Club
 Rick Haviland
 Outfitters Kauai
 Dale Verkaaik
 Outrigger Kiahuna Plantation
 Bob Keane
 Poipu Kai - Suite Paradise
 Valerie Roland
 Poipu Shopping Village
 Eric Napoleon
 Resort Quest at Poipu Kai
 Marvin Otsuji
 Seasport Divers
 Angela Vento
 Sheraton Kauai Resort
 Christopher Gampon
 The Point at Poipu

PBRA STAFF
 Jody Kono Kjeldsen
 Executive Director
 Kathy Leonard
 Office Manager

December 8, 2008



Ronald Sato, AICP
 Wilson Okamoto Corporation
 1907 South Beretania Street, Suite 400
 Honolulu, Hawai'i 96826

RE: Koloa-Poipu Regional Wastewater Reclamation Facility

Dear Mr. Sato:

Thank you for providing us with the Environmental Assessment and Environmental Impact Statement Preparation Notice for the Koloa-Poipu Regional Wastewater Reclamation Facility and for the opportunity to provide comment.

On behalf the Board of Directors of the Poipu Beach Resort Association, I would like to offer our strong support of the proposed Koloa-Poipu Regional Wastewater Reclamation Facility (WRF). We understand that the Regional WRF will be constructed on a portion of the former Koloa Mill site to treat wastewater collected to produce R-1 quality effluent. The project will also include a system of wastewater collection systems identified as: (1) Koloa Collection System; (2) Poipu Collection System; and (3) Eastern Collection System. This collection system includes new wastewater pump stations and gravity and force mains.

We agree that there is a critical need for the proposed Koloa-Poipu Regional Wastewater Reclamation Facility to provide improved wastewater collection and treatment facilities on a regional level serving existing and future land uses in the South Shore area extending from Koloa Town to Poipu and Kukuilua. We also believe that the Regional WRF will have a positive effect on the environment and on the Koloa-Poipu destination as whole.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Jody Kono Kjeldsen
 Executive Director

CC: Board of Directors



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 Fax: 808.946.2253
 www.wilsonokamoto.com

6607-40
 August 1, 2009

Ms. Jody Kono Kjeldsen, Executive Director
 Poipu Beach Resort Association
 P.O. Box 730
 Koloa, HI 96756

Subject: Environmental Impact Statement Preparation Notice for Koloa-Poipu Regional Wastewater Reclamation Facility Project
 Koloa, Kauai, Hawaii

Dear Ms. Kjeldsen:

Thank you for your letter date December 8, 2008. We appreciate the support of this project by your Board of Directors.

We concur that there is a critical need for this project and that it would have a beneficial impact on the environment as well as have a positive impact on the Koloa and Poipu areas as a whole.

A copy of the Draft EIS will be submitted for your department's review when published. Your letter, along with this response will be reproduced in the forthcoming Draft EIS. We appreciate your participation during this phase of the process.

Sincerely,

Ronald A. Sato, AICP
 Project Manager

cc: Julie Simonton - HOH Utilities, LLC

KOLOA-POIPU WASTEWATER NEEDS--TALK STORY MEETING

DECEMBER 6, 2007

NAME	AFFILIATION	TELEPHONE	E-MAIL
Chris Moore	KCA Board	742 6757	chris@poipu.beach.com
Louie Abrams	KCA Board	742 9537	labrams@kamairentals.com
HOWARD KROTTI	KCA Bd	742 6889	N/A.
MICHAEL FREEMAN	QUEST	742 6863	michael.freeman@hawaii.com
Ann Sokei		332-7381	
Gai Young	TKOC	742-7546	young9022@hawaii.rr.com
DAVID CHANG	KCA Malama Malama	639-4948	
Jeri DiPietro	Malama Maha'ulepu	651 1332	ofstone@aol.com
Linda Estes	KCA	742-8366	lestes14@yahoo.com
Scott SAUERS	KCA	742-9045	sauerspoipu@aol.com
PHIL NORMAN	KCA	635.9091	norman@hyatt.com
THOMAS DAVIS			
TESSIE KAWANAN	KCA	332-7100	
David Thorp	KCA Board	742-8455	pinaolani@hawaiiantel.net
Carol Ann Davis	KCA Board	742 6523	carolann.davis@aguaengineers.com
Walter Braunt	BConst.	742 6523	walt@aguaengineers.com
TK Blake	KCA	639-3248	tkblake@mac.com

KOLOA-POIPU WASTEWATER NEEDS--TALK STORY MEETING

DECEMBER 6, 2007

NAME	AFFILIATION	TELEPHONE	E-MAIL
Chris Moore	KCA Board	742 6757	chris@poipu.beach.com
Louie Abrams	KCA Board	742 9537	labrams@kamairentals.com
HOWARD KROTTI	KCA Bd	742 6889	N/A.
MICHAEL FREEMAN	QUEST	742 6863	michael.freeman@hawaii.com
Ann Sokei		332-7381	
Gai Young	TKOC	742-7546	young9022@hawaii.rr.com
DAVID CHANG	KCA Malama Malama	639-4948	
Jeri DiPietro	Malama Maha'ulepu	651 1332	ofstone@aol.com
Linda Estes	KCA	742-8366	lestes14@yahoo.com
Scott SAUERS	KCA	742-9045	sauerspoipu@aol.com
PHIL NORMAN	KCA	635.9091	norman@hyatt.com
THOMAS DAVIS			
TESSIE KAWANAN	KCA	332-7100	
David Thorp	KCA Board	742-8455	pinaolani@hawaiiantel.net
Carol Ann Davis	KCA Board	742 6523	carolann.davis@aguaengineers.com
Walter Braunt	BConst.	742 6523	walt@aguaengineers.com
TK Blake	KCA	639-3248	tkblake@mac.com

ROTARY CLUB OF POIPU BEACH

MEETING ATTENDANCE

DATE: 11-19-08

Last Name	First Name	Attend?	Last Name	First Name	Attend?
Baldwin	Peter		Kersten	Richard	✓
Bartolo	Robert	✓	McEvoy	Joseph	✓
Bedwell	Leeroy	✓	Miranda	Jimmy	✓
Bill	Michael	✓	Nishimoto	Craig	
Black	John	✓	Pittman	Susan	
Brown	William		Pimental	Milani	
Cable	Roberta		Prinzing	William	✓
Canute	Thomas	✓	Ransone	Gregory	✓
Carlsson	Michael	✓	Ray	Bob	✓
Case	James	✓	Richards	Kevin	
Chaffin	Lawrence		Richman	Monroe	✓
Charles	Roberta	✓	Rosendal	Gabriela	
Chytka	Tanya		Sheldon	Geoff	✓
Curtis	Michael	✓	Soderstrom	Ron	✓
Faunce	Margaret		Smith	Terrell	✓
Fuller	Leila	✓	Sterne	Peter	
Grantham	Bruce	✓	Steuri	Chris	✓
Gross	Thomas	✓	Ullis	John	✓
Hubble	Kashy	✓	Zastoupil	Connie	
Jackson	David		Zeevat	Hans	✓
Kanna	Nancy	✓			

Marcie Millett ✓

Honorary Members:

Batey, Thomas
 Bickel, G. Philip
 Lloyd, Robert

GUESTS:

Eric Napoleon
Sam Yates
Betsy Monroe
Kerth Vest
LaDonna McDowall

Poipu Beach Resort Association Meeting - October 9, 2008

List of Board and other PBRA members attending Thursday's meeting.

Board:
 Roy Thompson, Castle Resort Kiahuna Plantation (President)
 Greg Kamm, Greg Kamm Planning & Management (Vice President)
 Doug Sears, Grand Hyatt Kauai (Secretary)
 Jonathan Parrish, The Parrish Collection (Treasurer)
 Chris Gampon, The Point
 Bob Keane, Suite Paradise
 Eric Napoleon, Resort Quest at Poipu Kai
 Steve Yanarrell, Waiohai Beach Club
 Rick Haviland, Outfitters Kauai
 Marvin Otsuji, SeaSport Divers
 Lucy Kawaihalau, Kauai Vacation Rentals
 Dale Verkaaik, Outrigger Kiahuna Plantation

Other Members:
 Ernie Kanekoa & Arnie Albreicht (Makahuena)
 Shawn Shimabukuro & Michelle Swartman (Grove Farm Company)
 Marianne Martin + 1 (Whaler's Cove)
 Bob French OR Dave Boucher (Brennecke's)
 Vicki Agor (Garden Island Rentals)
 Susan Zollinger (Poipu Kapili)
 Chris White (Aikane Poipu Beach)

Staff:
 Jody Kjeldsen
 Kathy Leonard

Appendix B

Project Site Photos



Photo 1: South bound view of Waikomo Road



Photo 2: View of the Koloa Wastewater Pump Station site



Photo 3: Northwest bound View of Weliweli Road



Photo 4: West bound view of Yamada Road



Photo 5: View of the intersection at Weliweli Road and Ala Kinoiki



Photo 6: East bound view of Weliweli Road (private section) heading towards Koloa Mill



Koloa-Poipu Regional Wastewater Reclamation Facility Project

Project Site Photos

Photos

1-6



Photo 7: View of Koloa Mill



Photo 8: View of Recreational Baseyard



Photo 9: View of agricultural area/reservoirs



Photo 10: View of other activities in Mill area

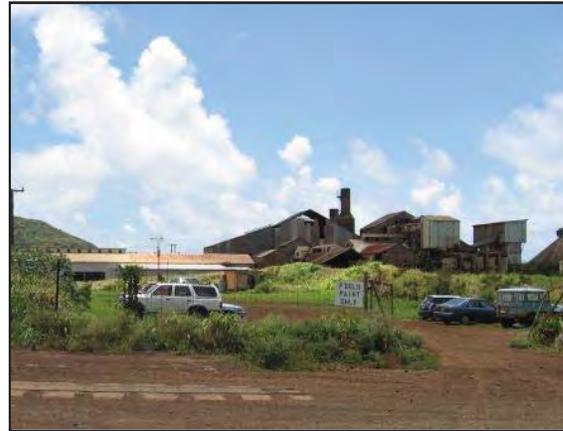


Photo 11: View of other users in the area



Photo 12: View of agricultural land



Koloa-Poipu Regional Wastewater Reclamation Facility Project

Project Site Photos

Photos

7-12



Photo 13: View of Mahealepu Road near the Mill



Photo 14: View of water tank



Photo 15: View of bagasse building



Photo 16: View of Infiltration Basin



Photo 17: South bound view of cane road going towards the Poipu Collection System



Photo 18 : East bound view of Poipu Road going towards the existing Poipu WRF



Koloa-Poipu Regional Wastewater Reclamation Facility Project

Project Site Photos

Photos

13-18



Photo 19: North bound view Hapa Road (trail)



Photo 20: View of Eastern WWPS



Photo 21: South bound view of Weliweli Road (private section) going towards the Eastern WWPS



Photo 22: View of Village WWPS site



Photo 23: Northern view of Koloa Eastern Bypass Road



Photo 24: View of Crater Pump Station site



Koloa-Poipu Regional Wastewater Reclamation Facility Project

Project Site Photos

Photos

19-24

Appendix C

*Biological and Water Assessments in Lower Waikomo Watershed for
the Koloa-Poipu Regional Wastewater Reclamation Facility Project,
Kauai*

AECOS, Inc.

August 3, 2009

Biological and water quality assessments in lower Waikomo Watershed for the Kōloa-Po'ipū Regional Wastewater Reclamation Facility Project, Kaua'i¹

August 3, 2009

AECOS No. 1173

Eric Guinther, Reginald David², and Susan Burr
AECOS, Inc. 45-939 Kamehameha Hwy, Suite 104

Kāne'ohe, Hawai'i 96744

Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Introduction

HOH Utilities, LLC—a State Public Utilities Commission (PUC) regulated utility company—is proposing to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region on the south shore of the Island of Kaua'i. The proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility (Regional WRF) and collection system (hereinafter collectively referred to as the “project”) is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.

This report combines the efforts of the vertebrate biologist, botanist and aquatic specialists into a single document encompassing biological and water quality concerns for the proposed Regional Wastewater Reclamation Project. The primary purpose of the environment surveys was to determine if there exists any botanical, avian, or mammalian species currently listed, or proposed for listing, under either federal or State of Hawai'i endangered species statutes within or adjacent to the study area. We were also tasked to evaluate the potential impacts that development of the project might pose to any sensitive or protected botanical, avian or mammalian species and habitats, and to propose

¹ Report prepared for Wilson Okamoto Corp. for use associated with environmental permitting for the Kōloa-Po'ipū Regional Wastewater Reclamation Project, Kaua'i.

² Rana Biological Consulting Inc.

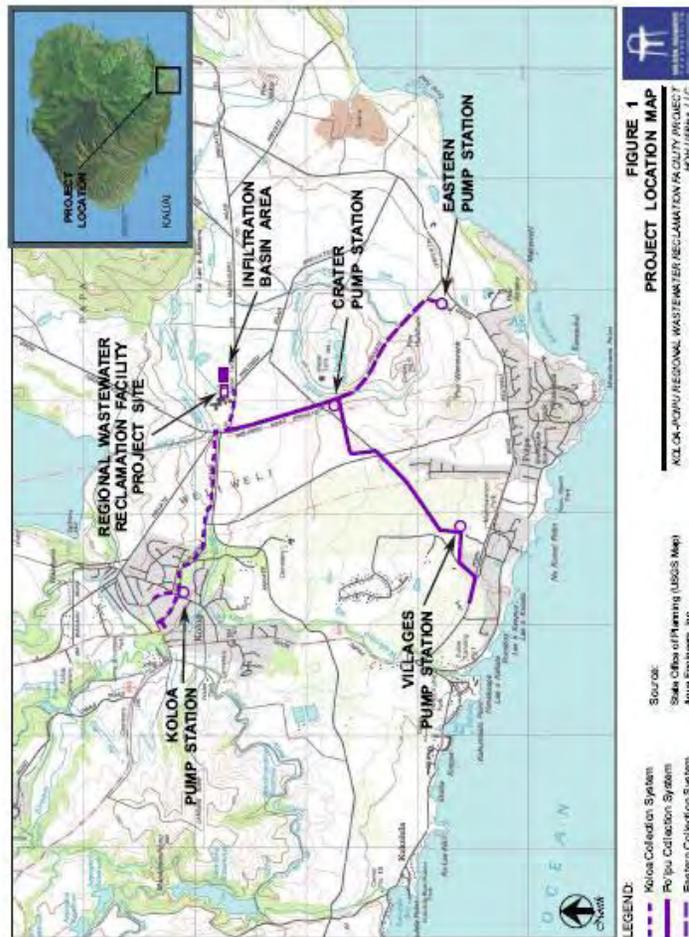
appropriate minimization and/or mitigative measures that could be implemented to reduce or eliminate any potentially negative impacts. The federal and State of Hawai'i listed species status follows species identified in the following referenced documents: Division of Land and Natural Resources (DLNR, 1998), Federal Register (2005), and U. S. Fish & Wildlife Service (USFWS, 2005, 2008). All fieldwork was conducted in January 2009.

Project and General Area Descriptions

The project area is the lower Waikomo watershed, which is assigned watershed code 23002 by the Department of Land and Natural Resources, Division of Aquatic Resources (DLNR-DAR, 2009). The proposed Regional WRF will be situated on an approximately 3.0-ac area within a portion of the existing former Kōloa Mill site identified as Tax Map Key (TMK) No. (4) 2-09- 001: portions of 001 and 002. This site consists of property located at the eastern end of Weliweli Road in Kōloa and owned by Grove Farm Company, Inc.

The wastewater collection system serving this Regional WRF's is planned to consist of the following three components, identified on Fig. 1:

- 1. Kōloa Collection System.** A wastewater collection system will be constructed having a service area that includes several existing developed properties and planned developments within the Kōloa Town area. This collection system is referred to as the “Kōloa Collection System”. New gravity sewer lines, and force mains would be routed within or along Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road in an eastbound direction to the proposed Regional WRF. A new wastewater pump stations (WWPS) would also be provided near the intersection of Waikomo Road with Weliweli Road.
- 2. Po'ipū Collection System.** A wastewater collection system will be constructed with a service area that includes several existing developed properties and planned developments within the Po'ipū area. This collection system is referred to as the “Po'ipū Collection System,” and will encompass a Po'ipū service area extending from the planned Kukui'ula development in the west to the area of the Grand Hyatt Kaua'i Resort and Spa in the east. The proposed collection system improvements include two (2) new wastewater pump stations, gravity sewer lines, and force mains.



3. Eastern Collection System. A wastewater collection system will be constructed with a service area that generally includes the area of the Po'ipū Bay Golf Course situated east of the Grand Hyatt Kaua'i Resort.

This collection system is referred to as the "Eastern Collection System". Collection system improvements include a new wastewater pump station, a gravity sewer line, and a force main. It is planned that the effluent from the Regional WRF will be used for irrigation on the Po'ipū Bay Golf Course.

The Waikomo watershed is drained by Waikomo Stream (State Perennial Stream No. 2-3-02), its tributaries, reservoirs, and irrigation systems. Much of the lower watershed was once in agriculture, primarily sugar cane production. Although some areas are still used to grow various crops or pasture horses, the landscape is gradually becoming dominated by housing and resort developments.

The tributary streams of Waikomo: Pō'ele'ele, Ōma'o, and Waihohonu, originate in the uplands to the north, within the Lihue-Kōloa Forest Reserve. These waters flow through various reservoirs and diversion ditches to eventually converge to form Waikomo Stream, which crosses the coastal lowlands of Po'ipū and enters the Pacific Ocean at Kōloa Landing (Fig. 2). Waikomo Stream is classified as perennial, having a total stream length of 34.7 km or 21.6 mi (DLNR-DAR, 2009).

Survey Methods

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text on page 30. Place names follow *Place Names of Hawaii* (Pukui, et al., 1974).

Aquatic Resources

On January 13, 2009, AECOS field biologists conducted a reconnaissance survey of waterbodies in the lower Waikomo watershed for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and collection. Of the various sites visited, only Waikomo Stream near Kōloa was found to harbor aquatic habitats.

Botanical Resources

Different easements and facility locations for the Project were surveyed between January 7 and 9, 2009. The project layout is mostly linear, tending to follow existing roads (some undeveloped and/or long abandoned), so the approach used was to traverse these routes on foot noting all of the species of plants encountered within about 10 m (30 ft) of the route centerline. A GPS unit (Trimble *GeoXT*) was used to record the routes taken by the botanist.

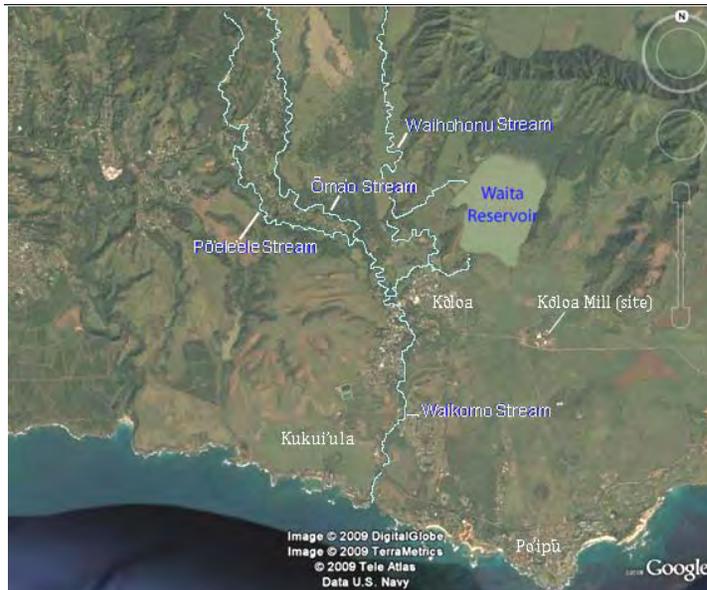


Figure 2. Waikomo watershed (code No. 23002) includes Waikomo Stream and its tributaries Pō'ele'ele, Ōma'o, Waihohonu streams, and associated reservoirs.

Plant names follow *Hawai'i's Ferns and Fern Allies* (Palmer, 2003) for ferns, *Manual of the Flowering Plants of Hawai'i* (Wagner et al., 1990, 1999) for native and naturalized flowering plants, and *A Tropical Garden Flora* (Staples and Herbst, 2005) for crop and ornamental plants.

Vertebrate Resources

A total of twenty-six (26) avian count stations were sited at approximately 300-meter intervals along the proposed wastewater easements. Eight-minute point counts were made at each station. Stations were each counted once. Field observations were made with the aid of Leitz 10 X 42 binoculars and by listening for vocalizations. Counts were concentrated between 7:30 a.m. and 10:30 a.m., the peak of daily bird activity. Time not spent counting was used to search the general project area for species and habitats not detected during count sessions. Surveys were conducted on the mornings of January 7, 8, and 9, 2009.

The avian phylogenetic order and nomenclature used in this report follows *The American Ornithologists' Union Checklist of North American Birds 7th Edition* (American Ornithologists' Union, 1998), and the 42nd through the 49th supplements to *Check-list of North American Birds* (American Ornithologists' Union, 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008). Mammal scientific names follow *Mammals in Hawaii* (Tomich, 1986).

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 Kauai 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 vertebrate species observed and heard within the project area.

Field Survey Results

Botanical Survey

Flora – A listing of the plants noted during the botanical survey is presented as Table 1. Given the nature of the survey area—long, narrow corridors encompassing a range of habitat types—the relative abundance definitions are somewhat generalized (typically, they would reflect abundance within a given area, but this survey covered many areas and vegetation types). Definitions are given in the legend at the end of the table, as are detailed explanations for notes indicated by number.

Table 1. Flora for Poipu Regional Wastewater Plan,
Koloa-Poipu, Kaua'i

<i>Species</i>	<i>Common name</i>	<i>Status</i>	<i>Abundance</i>	<i>Notes</i>
<i>FERNS and FERN ALLIES</i>				
POLYPODIACEAE				
<i>Phymatosorus grossus</i> (Langsd. & Fisch.) Brownlie	<i>lauae</i>	Nat	R	<1>
<i>FLOWERING PLANTS</i>				
DICOTYLEDONS				
ACANTHACEAE				
<i>Asystasia gangetica</i> (L.) T. Anderson	Chinese violet	Nat	O	
<i>Justicia betonica</i> L.	white shrimp plant	Nat	R	
<i>Thunbergia fragrans</i> Roxb.	sweet clockvine	Nat	U	
AMARANTHACEAE				
<i>Alternanthera pungens</i> Kunth	khaki weed	Nat	O	
<i>Amaranthus spinosus</i> L.	spiny amaranth	Nat	C	
<i>Gomphrena celosioides</i> Mart.	---	Nat	R	
ANACARDIACEAE				
<i>Mangifera indica</i> L.	mango	Nat	R	<1>
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	Nat	O	
APOCYNACEAE				
<i>Thevetia peruviana</i> (Pers.) K. Schum.	be-still tree	Nat	O	<1>
ARALIACEAE				
<i>Polyscias guilfoylei</i> (W. Bull) L.H. Bailey	panax	Orn	O	<1>
<i>Schefflera actinophylla</i> (Endl.) Harms	octopus tree	Nat	C	
ASTERACEAE (COMPOSITAE)				
<i>Bidens pilosa</i> L.	<i>ki</i>	Nat	C	
<i>Conyza</i> sp.		Nat	U	
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	---	Nat	U	
<i>Parthenium hysterophorus</i> L.	false ragweed	Nat	C	
<i>Emilia fosbergii</i> Nicolson	Flora's paintbrush	Nat	O	
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	Nat	C	
<i>Sonchus oleraceus</i> L.	sow thistle	Nat	U	
<i>Synedrella nodiflora</i> (L.) Gaertn.	nodeweed	Nat	C	
<i>Tridax procumbans</i> L.	coat buttons	Nat	U	
<i>Verbesina encelioides</i> (Cav.) Benth. & Hook.	golden crown-beard	Nat	O	
BIGNONIACEAE				
<i>Spathodea campanulata</i> P. Beauv.	African-tulip tree	Nat	U	<1>
BORAGINACEAE				
<i>Heliotropium curassavicum</i> L.	seaside heliotrope	Ind	U	
BRASSICACEAE				
<i>Coronopus didymus</i> (L.) Sm..	swinecress	Nat	U	

Table 1 (continued).

<i>Species</i>	<i>Common name</i>	<i>Status</i>	<i>Abundance</i>	<i>Notes</i>
CACTACEAE				
<i>Cereus uruguayanus</i> Ritter ex R.Kliesling	hedge cactus	Nat	C	
<i>Selenicereus macdonaldiae</i> (W.J. Hook.) Britton & Rose	queen-of-the-night	Nat	C	
CAPPARACEAE				
<i>Cleome gynandra</i> L.	wild spider flower	Nat	U	
CARICACEAE				
<i>Carica papaya</i> L.	papaya	Nat	R	<1>
CECROPIACEAE				
<i>Cecropia obtusifolia</i> Bertol.	guarumo	Nat	R	<1>
COMBRETACEAE				
<i>Terminalia catappa</i> L.	tropical almond	Nat	U	<1>
CONVOLVULACEAE				
<i>Ipomoea indica</i> (J. Burm.) Merr.	<i>koali'awa</i>	Ind	R	
<i>Ipomoea obscura</i> (L.) Ker-Gawl.	---	Nat.	O	
<i>Ipomoea triloba</i> L.	little bell	Nat.	O	
<i>Merremia tuberosa</i> (L.) Rendle	wood rose	Nat	R	
CRASSULACEAE				
<i>Kalanchoë pinnata</i> (Lam.) Pers.	air plant	Nat	C	
CUCURBITACEAE				
<i>Coccinia grandis</i> (L.) Voigt	scarlet-fruited gourd	Nat	R	
<i>Momordica charantia</i> L.	wild bitter melon	Nat.	U	
indet.	white-blotched lvs	---	R	<2>
EUPHORBACEAE				
<i>Chamaesyce albomarginata</i> (Torr. & A. Gray) Small	rattlesnake weed	Nat	U	
<i>Chamaesyce hirta</i> (L.) Millsp.	garden spurge	Nat	U	
<i>Chamaesyce hypericifolia</i> (L.) Millsp.	graceful spurge	Nat	U	
<i>Chamaesyce prostrata</i> (Aiton) Small	prostrate spurge	Nat	U	
<i>Codiaeum variegatum</i> (L.) Blume	croton	Orn	U	
<i>Euphorbia heterophylla</i> L.	<i>kaliko</i>	Nat	U	
<i>Euphorbia tirucalli</i> L.	pencil tree	Orn	R	<1>
<i>Ricinus communis</i> L.	castor bean	Nat	O	
FABACEAE				
<i>Canavalia cathartica</i> Thours	<i>maunaloa</i>	Nat	O	
<i>Canavalia</i> sp.	whitye & pink forms			
<i>Cassia</i> sp.	shower tree	Orn	U	<1,2>
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	Nat	U	
<i>Crotalaria incana</i> L.	fuzzy rattlepod	Nat.	U	
<i>Desmanthus pernambucanus</i> (L.) Thellung	virgate mimosa	Nat	U	
<i>Indigofera hendecaphylla</i> Jacq.	creeping indigo	Nat	R	
<i>Indigofera suffruticosa</i> Mill.	indigo	Nat	U	

Table 1 (continued).

<i>Species</i>	<i>Common name</i>	<i>Status</i>	<i>Abundance</i>	<i>Notes</i>
FABACEAE (cont.)				
<i>Leucaena leucocephala</i> (Lam.) deWit	<i>koa haole</i>	Nat	A	
<i>Macroptilium lathyroides</i> (L.) Urb.	cow pea	Nat	U	
<i>Mimosa pudica</i> L.	sensitive plant	Nat	R	
<i>Neonotonia wightii</i> (Wight & Arnott) Lackey	glycine	Nat	R	
<i>Pithecellobium dulce</i> (Roxb.) Benth.	' <i>opiuma</i>	Nat	R	
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	<i>kiawe</i>	Nat	U	
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	Nat	U	<1>
<i>Senna alata</i> (L.) Roxb.	candle bush	Nat	R	<1>
<i>Senna occidentalis</i> (L.) Link	coffee senna	Nat	U	
<i>Senna surattensis</i> (N.L. Burm.) H. Irwin & Barneby	<i>kolomana</i>	Nat	U	<1>
GOODINACEAE				
<i>Scaevola taccada</i> (J. Gaert.) Roxb.	<i>naupaka kahakai</i>	Ind	R	
LAMIACEAE				
<i>Leonotis nepetifolia</i> (L.) R.Br.	lion's ear	Nat	O	
MALVACEAE				
<i>Abutilon grandifolium</i> (Wild.) Sweet	hairy abutilon	Nat	U	
<i>Hibiscus rosa-sinensis</i> L.	Chinese hibiscus	Orn	R	
<i>Malvastrum coromendalianum</i> (L.) Garcke	false mallow	Nat	U	
<i>Sida acuta</i> N. L. Burm.	---	Nat	R	
<i>Sida fallax</i> Walp.	' <i>ilima</i>	Ind	U	
<i>Sida ciliaris</i>		Nat	R	
<i>Sida rhombifolia</i> L.	Cuba jute	Nat	U	
<i>Sida spinosa</i> L.	prickly sida	Nat	C	
MORACEAE				
<i>Ficus microcarpa</i> L. fil.	Chinese banyan	Nat.	R	
MYRTACEAE				
<i>Eucalyptus deglupta</i> Blume	kamarere	Nat	R	<1>
<i>Eucalyptus</i> sp.		Nat	R	<1>
<i>Psidium cattleianum</i> Sabine	strawberry guava	Nat	U3	<1>
<i>Psidium guajava</i> L.	commom guava	Nat	R	<1>
<i>Syzygium cumini</i> (L.) Skeels.	Java plum	Nat	C	
NYCTAGINACEAE				
<i>Boerhavia coccinea</i> Mill.	false <i>alena</i>	Nat	O	
<i>Mirabilis jalapa</i> L.	marvel-of-Peru	Nat	R	
ONAGRACEAE				
<i>Ludwigia octovalvis</i> (Jacq.) Raven	primrose willow	Nat	R	
PAPAVERACEAE				
<i>Argemone mexicana</i> L.	Mexican poppy	Nat	U	

Table 1 (continued).

<i>Species</i>	<i>Common name</i>	<i>Status</i>	<i>Abundance</i>	<i>Notes</i>
PHYTOLACCACEAE				
<i>Rivina humilis</i> L.	coral berry	Nat	R	
POLYGONACEAE				
<i>Coccoloba uvifera</i> (L.) L.	sea-grape	Nat	R	<1>
PORTULACACEAE				
<i>Portulaca oleracea</i> L.	pigweed	Nat	R	
PROTEACEAE				
<i>Grevillea robusta</i> R. Brown	silk-oak	Nat	R	
RUTACEAE				
<i>Murraya paniculata</i> (L.) W. Jack	mock orange	Orn	R	
SOLANACEAE				
<i>Datura stramonium</i> L.	Jimson weed	Nat	U	
<i>Physalis peruviana</i> L.	Cape gooseberry	Nat	R	
<i>Solanum americanum</i> P. Miller	<i>pōpolo</i>	Pol	U	
<i>Solanum lycopersicum</i> var. <i>cerasiforme</i> (Dunal) Spooner, G. Anderson, & Jansen	cherry tomato	Nat	U	
<i>Solanum seaforthianum</i> Andr.	---	Nat	R	
STERCULIACEAE				
<i>Waltheria indica</i> L.	' <i>uhaloa</i>	Ind.	O	
VERBENACEAE				
<i>Citharexylum spinosum</i> L.	fiddlewood	Nat	U	<1>
<i>Lantana camara</i> L.	lantana	Nat	U	
<i>Stachytarpheta cayennensis</i> (Rich.) Vahl	nettle-leaved vervain	Nat		
<i>Stachytarpheta jamaicensis</i> (L.) Vahl	Jamaican vervain	Nat	R	
<i>Vitex trifolia</i> L.	blue vitex	Nat		
MONOCOTYLEDONS				
AGAVACEAE				
<i>Cordyline fruticosa</i> (L.) A. Chev.	ti cultivars	Orn	U	
<i>Furcraea foetida</i> (L.) Haw.	Mauritius hemp	Nat	C	
<i>Furcraea selloa</i> var. <i>marginata</i>	uncertain ID	Orn	R	<1>
ARACEAE				
<i>Epipremnum pinnatum</i> 'Aureum' J. Linden & André	pothos	Nat	R	
ARECACEAE				
<i>Roystonea regia</i> (Kunth) O. F. Cook	Cuban royal palm	Orn	R	<1>
<i>Ptychosperma macarthurii</i> (Veitch) J. D. Hook.	Macarthur palm	Orn	R	<1>
BROMELIACEAE				
<i>Billbergia pyramidalis</i> (Sims) Lindley	summer-torch	Orn	R	<1>
COMMELINACEAE				
<i>Commelina diffusa</i> N. L. Burm.	dayflower	Nat	R	

Table 1 (continued).

Species	Common name	Status	Abundance	Notes
CYPERACEAE				
<i>Cyperus rotundus</i> L.	nut grass	Nat	R	
PANDANACEAE				
<i>Pandanus textorius</i> S. Parkinson ex Z	<i>hala</i>	Ind	R	<1>
POACEAE (GRAMINEAE)				
<i>Axonopus fisifolius</i> (Raddi) Kuhl.	nrv-lvd carpetgrass	Nat	R	
<i>Bothriochloa pertusa</i> (L.) A. Camus	pitted beardgrass	Nat	A	
<i>Cenchrus ciliaris</i> L.	buffelgrass	Nat	U	
<i>Chloris barbata</i> (L.) Sw.	swollen fingergrass	Nat	A	
<i>Chloris radiata</i> (L.) Sw.	radiate fingergrass	Nat	U	
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Nat	O	
<i>Digitaria insularis</i> (L.) Mez ex Ekman	sourgrass	Nat	A	
<i>Echinochloa colona</i> (L.) Link	jungle-rice	Nat	R	
<i>Eleusine indica</i> (L.) Gaertn.	wiregrass	Nat	C	
<i>Eragrostis cilianensis</i> (All.) Link	stinkgrass	Nat	R	
<i>Eragrostis pectinacea</i> (Michx.) Nees	Carolina lovegrass	Nat	O	
<i>Leptochloa uninvia</i> (K.Presl.) Hitchc. & Chase	sprangletop	Nat	R	
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	Nat	A	
<i>Paspalum fimbriatum</i> Kunth	fimbriate paspalum	Nat	O	
<i>Paspalum dilatatum</i> Poir.	Dallis grass	Nat	R	
<i>Paspalum</i> sp.	---	Nat.	R	
<i>Saccharum officinarum</i> L.	sugar cane	Orn	R	<1>
<i>Setaria verticillata</i> (L.) P. Beauv.	bristly foxtail	Nat	R	
<i>Sporobolus africanus</i> (Poir.) Robyns & Tournay	smutgrass	Nat	R	
<i>Sporobolus indicus</i> (L.) R. Br.	Indian dropseed	Nat	U	
<i>Urochloa maxima</i> (Jacq.) Webster	Guinea grass	Nat	A	
<i>Zea mays</i> L.	corn	Orn	R	

Legend to Table 1

Status = distributional status

End. = endemic; native to Hawai'i and found naturally nowhere else.**Ind.** = indigenous; native to Hawai'i, but not unique to the Hawaiian Islands.**Nat.** = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.**Orn.** = exotic, ornamental or cultivated crop; plant not naturalized (not well-established outside of cultivation, at least at this location).**Pol.** = Polynesian introduction; brought to the Hawaiian Islands before 1778.

Abundance = occurrence ratings for plants on property in March 2008

R - Rare - seen in only one location and only one or a few plants present.

U - Uncommon - generally rare, but seen in more than one location.

O - Occasional - found regularly, but not abundant anywhere.

C - Common - abundant in some areas, or regularly encountered in many areas.

A - Abundant; present in large numbers somewhere in the survey area; dominant in some areas.

Table 1 (continued).

Notes:

<1> Seen mostly as plantings around developed areas.

<2> Plant lacking fruit or flowers and therefore identification uncertain.

In all, 133 species of plants were identified from various parts of the survey area. Only 6 of these (or 4.5%) are native Hawaiian plant species, all considered indigenous (native to Hawai'i and other Pacific Islands, as opposed to endemic species that are unique to the Hawaiian Islands).

Because the survey included some developed area, a number of ornamentals were recorded as well. However, in such areas, the survey was limited to species observed close to the road where an impact from the project might actually occur. In areas of natural vegetation, survey limits were typically extended out beyond the swath of potential adverse impacts to vegetation since construction activities and access routes needed to be taken into account.

Vegetation - As might be expected given the nature of the project (long, narrow corridors), the nature of the vegetation varies considerably. Much of the area consisted of improved and unimproved roadways, with the vegetation typical of ruderal weeds found along verge areas and or maintained landscaping in some of the more developed areas. Along unimproved roads, the vegetation tended to be either agricultural, pasture, abandoned agricultural fields (covered by ruderal herbs and grasses), or shrublands dominated by *koa haole* (*Leucaena leucocephala*). An interesting variation on the *koa haole* shrubland are areas of mixed *koa haole* and hedge cactus (*Cereus guayanus*; see Fig. 3), with an understory (ground cover) of a type of snake cactus (*Selenicereus macdonaldiae*). Virtually all of the lands crossed by the project components are highly disturbed or have been previously highly disturbed, and no areas supporting native plant assemblages occur that would be impacted by the project.

Aquatic Environments

The streams in this watershed are very much interconnected with the agricultural irrigation system built over a century ago to sustain extensive sugar cane cultivation and processing of cane at the Kōloa Mill. In addition to moving water within the Waikomo watershed, the Kōloa irrigation system is also connected to the Hule'ia Stream system to the north. The Kōloa irrigation system is now in a state of disrepair as the large landowners have subdivided their properties for diversified agriculture and residential housing developments. Some components of the irrigation systems have been diverted

to other crops and some are no longer used at all. Two reservoirs in the watershed have been drained recently because of concerns that the dams are at risk of failure (TenBruggencate, 2007).



Figure 3. Area of ruderal weeds along a little-used track bordered by *koa haole*/hedge cactus scrub-shrub “forest”.

A National Wetland Inventory (NWI; USFWS, 2009b) of the area shows a wetland located well to the east of the proposed Regional Wastewater Reclamation Facility. This “wetland” is classified as a palustrine, unconsolidated bottom, artificially flooded, permanently flooded, diked or impounded (PUBKHh) and palustrine, emergent, persistent, artificially flooded, semipermanently flooded, diked or impounded, (PEM1KFh) wetland (green and blue areas in Fig. 4). This site is a remnant of the Kōloa Mill settling basin, but was not inspected in January 2009. However, remnants of the settling basins not captured by the USFWS inventory but located close to the proposed Regional Wastewater Reclamation Facility site location were inspected. These former settling ponds once served to clean sugar cane washwater arising from mill operations. The settling basin area is now completely overgrown with

Guinea grass (*Urochloa maxima*) except where ongoing grading is occurring to recover soil from the solids settled in the basins (Fig. 5). The ponds as originally configured no longer exist. The water seen in the photograph is ponded rain water in a depression or basin made by the recent soil recovery operations. This feature would not be considered a jurisdictional wetland regulated under the Clean Water Act because it lacks wetland hydrology (it is an isolated depression) and wetland vegetation (USACE, 1987).



Figure 4. USFWS (2009b) presumed wetlands (in blue and green) in the project area. Only the area designated “Soil Pit” is close to the project site, but this former settling basin is not a wetland.

The Koloa Quadrangle USGS topographic map (USGS, 1996) shows that the “wetland” at the Regional Wastewater Reclamation Facility project site is connected to or lies close to a branch ditch that went to the mill from the Waita

Reservoir Ditch. The map also shows that the Kōloa collection system will cross an abandoned flume that once connected Wikomo Stream and Waita Reservoir Ditch (evident only where it crosses Weliweli Road). The eastern collection system will cross the "Short Siphon Ditch" and the "Mill Ditch", both of which are no longer functional. Distribution of water to agricultural ventures in this area is now accomplished by underground pipes.



Figure 5. Former settling basin pond area east of the Kōloa Sugar Mill (in background). Note grubbing and stockpiling of settled solids.

Water Quality

Because water was not present in the project site at the time of the survey, samples were not collected for water quality analysis. However, AECOS collected and analyzed water quality data from streams in the Waikomo watershed in 1994, 1995, and 2009 (AECOS, 1994, 1995, 2009) and the Hawai'i Department of Health collected and analyzed water quality data from Waikomo Estuary from 1990 to 1999 and 2006 (USEPA, 2009). These data are summarized in Tables 2 and 3.

Mean temperature and pH values recorded in Waikomo Watershed are typical of coastal plain streams and estuaries. The measured conductivity values are within the range of expected values, with stations that have higher conductivity

levels demonstrating greater groundwater input. The salinity values measured in Waikomo Estuary range from mostly freshwater (8 ppt) to seawater (37 ppt), with a mean value of 31 ppt—results typical of a slightly brackish system. The mean dissolved oxygen (DO) saturation levels measured in the sluggish flow of Waihohonu Stream and Ōma'ō Stream are low. The geometric means of turbidity levels measured throughout the watershed are high, although the geometric means of TSS levels are not. The geometric mean ammonia concentration measured in Waihohonu Stream is high, but the geometric means of nitrate + nitrite, total nitrogen, and total phosphorus concentrations are fairly low. The opposite is true in Waikomo Stream and Ōma'ō Stream where the geometric mean ammonia concentrations were low, but the geometric means of nitrate + nitrite, total nitrogen, and total phosphorus concentrations were high. Waikomo Estuary monitoring efforts show typically low bacterial content, although high concentrations are evident on certain sampling events.

Table 2. A summary of selected basic water quality characteristics of Waikomo Watershed.

Reach	Salinity (ppt)	Cond. (µmhos/cm)	Temp. (°C)	pH	DO (mg/l)	DO sat. (%)	Turbidity (ntu)	TSS (mg/l)
Waihohonu Stream (AECOS, 1994)†								
mean	--	107.5	22.4	6.95	3.53	41	13.3*	4.2*
min		75.8	21.5	6.80	1.57	18	5.22	1.4
max		158.9	23.3	7.04	6.67	77	58.3	15.2
n		4	4	4	4	4	4	4
Waikomo Stream (AECOS, 1995)†								
mean	--	185.4	24.0	7.51	7.48	89	12.2*	14.4*
min		168.2	22.9	6.93	6.19	73	8.31	10.5
max		196.4	25.5	7.95	7.98	95	26	18.5
n		3	4	3	4	4	3	3
Ōma'ō Stream (AECOS, 2009) †								
mean	--	180	22.0	6.72	5.78	66	13.2*	7.3*
min		156	21.7	6.58	5.44	62	10.8	5.3
max		226	22.3	6.81	6.30	72	15.0	8.7
n		3	3	3	3	3	3	3
Waikomo Estuary (USEPA, 2009)‡								
mean	31	--	25.2	8.1	6.5	94.4	18*	--
min	8		21.2	7.5	2.3	90.5	3	
max	37		27.8	8.5	8.3	100.1	76	
n	128		61	38	55	15	29	

† data collected at three to four different sampling stations on a single date

‡ data collected at a single sampling location over a number of years (1990 to 1999, 2006)

* geometric mean

Table 3. A summary of selected nutrient and bacterial water quality characteristics of Waikomo Watershed. Data collected by AECOS (1994, 1995, 2009) and HDOH (USEPA, 2009).

Reach	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)	Fecal col. (no./100 ml)	Enteroc. (no./100 ml)	C. perfrin. (no./100 ml)
Waihohonu Stream (AECOS, 1994)†							
mean	48	51	327	12	--	--	--
min	26	5	208	2			
max	98	425	614	48			
n	4	4	4	4			
Waikomo Stream (AECOS, 1995)†							
mean	7	256	515	41	--	--	--
min	6	228	470	29			
max	10	312	550	53			
n	3	3	3	3			
Ōma'o Stream (AECOS, 2009) †							
mean	9	390	663	58	--	--	--
min	6	387	648	55			
max	12	396	678	59			
n	3	3	3	3			
Waikomo Estuary (USEPA, 2009)‡							
mean	--	--	--	--	6	11	2
min					1	<1	<1
max					208	2000	51
n					40	127	111

† data collected at three to four different sampling stations on a single date

‡ data collected at a single sampling location over a number of years

* geometric mean

Aquatic Biota

No aquatic species were observed in the project area during the January 2009 site visit. The biologists observed a green sea turtle (*Chelonia mydas* or *honu*), a marine animal, hauled out on the boulder revetment in Waikomo Estuary, within the watershed, but well away from potential impacts associated with the influence of the Kōloa-Po'ipū Regional Wastewater Reclamation Facility project construction. Previous studies of the streams and reservoirs within the

Waikomo watershed have reported the amphidromous shrimp, *Atyoida bisulcata* or '*opae kala'ole*, an endemic species, and the amphidromous goby, *Awaous guamensis* or '*o'opu nakea*, an indigenous species, as present (DLNR-DAR, 2009; AECOS, 1995; and Timbol & Maciolek, 1978 as cited in AECOS, 1994 & 1995). These and other introduced aquatic animals reported from streams and reservoirs in Waikomo Watershed are listed in Table 4.

Table 4. Checklist of aquatic biota reported from Waikomo Watershed.

Species	Common name	Status	Stream	Rel. Abund.	Notes
<i>AQUATIC INVERTEBRATES</i>					
MOLLUSCA, GASTROPODA	(mollusks)				
PHYSIDAE					
	<i>Physa virgata</i>	pond snail	Nat	Ōma'o	U <5>
THIARIDAE					
	<i>Melanoides tuberculata</i>	melanid snail	Nat	Ōma'o	C <5>
MOLLUSCA, BIVALVIA	(clams)				
	<i>Corbicula fluminea</i> †	Asiatic clam	Nat	Ōma'o Waikomo Waihohonu All	U <5> C <4> C <3> p <1>
ARTHROPODA, CRUSTACEA	(crustaceans)				
ATYIDAE					
	<i>Atyoida bisulcata</i>	<i>opae kala'ole</i>	End	Waikomo	A <2>
CAMBARIDAE					
	<i>Procambarus clarkii</i>	American crayfish	Nat	Ōma'o Waikomo	U <5> O <2>
PALAEMONIDAE					
	<i>Macrobrachium lar</i>	Pacific prawn	Nat	Waikomo All	A <4> p <1>
ARTHROPODA, INSECTA	(insects)				
ODONATA, unidentified	dragonfly		Nat	Waikomo	U <4>
ODONATA, LIBELLULIDAE					
	<i>Orthemis ferruginea</i>	roseate skimmer	Nat	Ōma'o	R <5>
	<i>Pantala flavescens</i>	skimmer	Ind	Waikomo	U <4>
ODONATA, COENAGRIONIDAE					
	<i>Enallagma civile</i>	bluet	Nat	Waikomo	U <4>
	<i>Ischnura posita</i>	fragile forktail	Nat	Ōma'o	U <5>
	<i>Ischnura ramburi</i>	Rambur's damselfly	Nat	Ōma'o	R <5>

Table 4 (continued).

Species	Common name	Status	Stream	Rel.	
				Abund.	Notes
VERTEBRATES (fishes)					
VERTEBRATA, PISCES					
CICHLIDAE					
<i>Tilapia sp.</i>	tilapia	Nat	All	p	<1>
<i>Sarotherodon melanotheron</i>	blackchin tilapia	Nat	Ōma'o	O	<5>
			Waihohonu	C	<3>
<i>Sarotherodon mossambica</i>	Mozambique tilapia	Nat	Waikomo	C	<4>
			Waihohonu	C	<3>
CENTRARCHIDAE					
<i>Lepomis sp.</i>	bluegill	Nat	All	p	<1>
<i>Micropterus sp.</i>	bass	Nat	All	p	<1>
<i>Micropterus ?dolomieu</i>	smallmouth bass	Nat	Waihohonu	U	<3>
CLARIDAE					
<i>Clarius fuscus</i>	Chinese catfish	Nat	Waikomo	C	<2>
CYPRINIDAE					
unident.	carp	Nat	All	p	<1>
GOBIIDAE					
<i>Awaous guamensis</i>	'o'opu nakea	Ind	Waikomo	C	<4>
			Waikomo	C	<2>
			All	p	<1>
POECILIIDAE					
undet. poeciliid	top minnow	Nat	Ōma'o	C	<5>
<i>Gambusia affinis</i>	mosquitofish	Nat	Waihohonu	A	<3>
<i>Poecilia reticulata</i>	rainbow fish or guppy	Nat	Ōma'o	U	<5>
			Waikomo	A	<4>
			Waikomo	A	<2>
			All	p	<1>
<i>Xiphophorus helleri</i>	swordtail	Nat	Ōma'o	C	<5>
			Waikomo	C	<4>
			Waikomo	C	<2>
			All	p	<1>
VERTEBRATA, AMPHIBIA (amphibians)					
BUFONIDAE					
<i>Bufo marinus</i>	giant neotropical toad	Nat	Waikomo	O	<4>
			All	p	<1>
RANIDAE					
<i>Rana catesbeiana</i>	American bullfrog	Nat	Ōma'o	U†	<5>
			Waihohonu	O	<3>

Table 4 (continued).

Species	Common name	Status	Stream	Rel.	
				Abund.	Notes
VERTEBRATA, REPTILIA (reptiles)					
CELONIIDAE					
<i>Chelonia mydas</i>	honu	Ind	Waikomo‡	R	<5>
KEY TO SYMBOLS USED:					
Status:					
nat - naturalized. An introduced or exotic species.					
ind - indigenous. A native species also found elsewhere in the Pacific.					
end - endemic - A native species found only in the Hawaiian Islands.					
Abundance at survey locations:					
p - present; abundance not determined.					
R - rare; only one or two individuals seen.					
U - uncommon; several individuals seen, in some habitat places visited.					
C - common; numerous individuals seen, or seen in most habitat places visited.					
A - abundant; numerous in most habitat places visited					
Notes:					
<1> DLNR-DAR, 2009. Unspecified location: stream in system or watershed (All) and date of survey either 1962 or 1995.					
<2> Timbol and Maciolek, 1978 (data given in AECOS, 1994 & 1995).					
<3> AECOS, 1994.					
<4> AECOS, 1995.					
<5> AECOS, 2009.					
† - Identified by call, carapace, or shell only					
‡ - Present in Waikomo Estuary (Kōloa Landing) only.					

Avian Survey Results

A total of 1777 individual birds of 29 species, representing 20 separate families, were recorded during station counts (Table 5). One species detected, Hawaiian Goose (*Nēnē* or *Branta sandvicensis*), is endemic to the Hawaiian Islands and is listed under both Federal and State of Hawaii endangered species statutes. Two other species detected, White-tailed Tropicbird (*Phaethon lepturus dorothea*), and Pacific Golden-Plover (*Pluvialis fulva*), are indigenous; the former is an indigenous breeding species and the latter is an indigenous migratory species. The remaining 26 species detected are regularly encountered alien species, common in low to mid-elevation areas on the Island of Kaua'i.

Avian diversity and densities were in keeping with the locations and the habitats present along the proposed wastewater easement corridor and other associated appurtenances. Five species, Rock Pigeon (*Columba livia*), Common

Myna (*Acridotheris tristis*), House Finch (*Carpodacus mexicanus*), Nutmeg Mannikin (*Lonchura punctulata*), and Red Avadavat (*Amandava amandava*), accounted for 52% of the total number of all birds recorded during station counts. The most commonly recorded species was Rock Pigeon, which accounted for 23% of the total number of individual birds recorded. An average of 68 birds was detected per station count.

Table 5. Avian Species Count Results

Common Name	Scientific Name	ST	RA
ANSERIFORMES			
ANATIDAE - Ducks, Geese & Swans			
Anserinae - Geese & Swans			
Hawaiian Goose (Nēnē)	<i>Branta sandvicensis</i>	EE	0.50
GALLIFORMES			
PHASIANIDAE - Pheasants & Partridges			
Phasianinae - Pheasants & Allies			
Black Francolin	<i>Francolinus francolinus</i>	A	0.46
Red Junglefowl	<i>Gallus gallus</i>	A	3.69
Ring-necked Pheasant	<i>Phasianus colchicus</i>	A	0.04
PELECANIFORMES			
PHAETHONTIDAE – Tropicbirds			
White-tailed Tropicbird	<i>Phaethon lepturus</i>	IB	0.04
CICONIIFORMES			
ARDEIDAE - Herons, Bitterns & Allies			
Cattle Egret	<i>Bubulcus ibis</i>	A	2.35
PELECANIFORMES			
PHAETHONTIDAE - Tropicbirds			
White-tailed Tropicbird	<i>Phaethon lepturus</i>	IB	0.04
CHARADRIIFORMES			
CHARADRIIDAE - Lapwings & Plovers			
Charadriinae - Plovers			
Pacific Golden-Plover	<i>Pluvialis fulva</i>	IM	0.54

Table 5 (continued).

Common Name	Scientific Name	ST	RA
COLUMBIFORMES			
COLUMBIDAE – Pigeons & Doves			
Rock Pigeon	<i>Columba livia</i>	A	15.42
Spotted Dove	<i>Streptopelia chinensis</i>	A	2.12
Zebra Dove	<i>Geopelia striata</i>	A	3.85
PSITTACIFORMES			
PSITTACIDAE - Lories Parakeets, Macaws & Parrots			
Psittacinae - Typical Parrots			
Rose-ringed Parakeet	<i>Psittacula krameri</i>	A	0.04
PASSERIFORMES			
ALAUDIDAE - Larks			
Sky Lark	<i>Alauda arvensis</i>	A	0.12
SYLVIIDAE, Sylviinae – Old World Warblers			
Japanese Bush-Warbler	<i>Cettia diphone</i>	A	0.46
TURDIDAE – Thrushes			
White-rumped Shama	<i>Copsychus malabaricus</i>	A	0.27
TIMALIIDAE – Babblers			
Hwamei	<i>Garrulax canorus</i>	A	0.38
ZOSTEROPIDAE – White-Eyes			
Japanese White-eye	<i>Zosterops japonicus</i>	A	3.65
MIMIDAE – Mockingbirds & Thrashers			
Northern Mockingbird	<i>Mimus polyglottos</i>	A	0.85
STURNIDAE – Starlings			
Common Myna	<i>Acridotheres tristis</i>	A	8.08
EMBERIZIDAE – Emberizids			
Red-crested Cardinal	<i>Paroaria coronata</i>	A	1.19
CARDINALIDAE – Cardinals Saltators & Allies			
Northern Cardinal	<i>Cardinalis cardinalis</i>	A	1.19
ICTERIDAE - Blackbirds			
Western Meadowlark	<i>Sturnella neglecta</i>	A	0.81
FRINGILLIDAE – Fringilline and Cardueline			
Finches & Allies			
Carduelinae – Carduline Finches			
House Finch	<i>Carpodacus mexicanus</i>	A	6.23
PASSERIDAE - Old World Sparrows			
House Sparrow	<i>Passer domesticus</i>	A	0.62

Table 5 (continued).

Common Name	Scientific Name	ST	RA
	ESTRILDIDAE – Estrildid Finches		
	Estrildinae – Estrildine Finches		
Common Waxbill	<i>Estrilda astrild</i>	A	1.77
Red Avadavat	<i>Amandava amandava</i>	A	5.54
African Silverbill	<i>Lonchura cantans</i>	A	0.08
Nutmeg Mannikin	<i>Lonchura punctulata</i>	A	5.88
Chestnut Munia	<i>Lonchura atricapilla</i>	A	0.96
Java Sparrow	<i>Padda oryzivora</i>	A	0.81
Key to Table 5			
ST	Status		
RA	Relative Abundance: Number of birds detected divided by the number of count stations (26)		
EE	Endangered Endemic species – native and unique to Hawai'i, and listed as endangered		
A	Alien species – introduced to Hawai'i by humans, and have become established in the wild		
IB	Indigenous Breeding species – native to the Hawaiian Islands, but also found elsewhere naturally		
IM	Indigenopus Migratory species - native to the Hawaiian Islands, but also found elsewhere naturally		

Mammalian Survey Results

We detected eight mammalian species during the course of the surveys (Table 6). All but one of these species (*Sus s. scrofa*) was seen at one or more locations within the study corridors. Additionally, scat, tracks and sign of all but one species, domestic goat (*Capra h. hircus*), were encountered at several locations within the study corridors. All eight mammalian species detected during the course of this survey are considered to be alien species in the Hawaiian Islands. The endangered Hawaiian hoary bat was not seen during the course of this survey.

No mammalian species 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 (DLNR, 1998; Federal Register, 2005; USFWS, 2005, 2008).

Table 6. Mammalian Species Detected
Kōloa-Po'ipū Regional Wastewater Project

Common Name	Scientific Name	A/V	S/T
	CARNIVORA- Flesh -Eaters		
	Canidae - Wolves, Jackals & Allies		
Domestic dog	<i>Canis f. familiaris</i>	X	X
	Felidae- Cats		
House cat	<i>Felis catus</i>	X	X
	PERISSODACTYLA - Odd-Toed Ungulates		
	Equidae - Horses, Asses & Zebras		
Domestic horse	<i>Equus c. caballus</i>	X	X
Donkey	<i>Equus a. asinus</i>	X	
Mule	<i>Equus asinus x Equus caballus</i>	X	
	ATRIODACTYLA - Even-Toed Ungulates		
	Suicidae - Old World Swine		
Pig	<i>Sus s. scrofa</i>		X
	Bovidae- Hollow-horned Ruminants		
Domestic cattle	<i>Bos Taurus</i>	X	X
Domestic goat	<i>Capra h. hircus</i>	X	

Key to Table 5.

A/V Audio or Visual – detection

S/T Scat, Track or Sign – detection

X Detection

Discussion

Botanical Resources

Given the highly disturbed nature of the landscape in the project area, it is not surprising that botanical resources of concern or worthy of preservation are absent. Native species of plants are generally uncommon; only *uhaloa* (*Waltheria indica*) was seen with any regularity and is a common native in dry, disturbed areas.

At least two species of cactus are well established in the area near the coast. These species were introduced by the Moir family living near Po'ipū in the 1930s (Benson, 1982) and perhaps the Allertons who made extensive plantings

of cacti and succulents around their estate in Lāwa'i Valley and several species have since spread outward, becoming significant invasive plants in the Kukui'ula to Po'ipū region of southern Kaua'i. No listed species (USFWS, 2005, 2009a) were encountered and none is expected to occur in the areas subject to disturbance by the proposed project owing to the fact that nearly all of the routes proposed for the project pass through very disturbed vegetation or where the vegetation has been disturbed in previous decades with regrowth strongly favoring non-native invasive species.

Streams and other aquatic resources

Overall, the streams in Waikomo Watershed, including Waihohonu Stream, Ōma'o Stream, and Waikomo Stream, appear to be somewhat degraded. Years of modifications for agricultural uses have impacted stream water quality, flow characteristics, and biotic composition. Waikomo Stream is listed on the Hawai'i Department of Health (HDOH) 2006 list of impaired waters in Hawai'i, prepared under Clean Water Act §303(d). This listing indicates that the stream may not meet the Hawai'i Water Quality Standards, potentially exceeding the wet season water quality criteria for nitrates, Total N, and turbidity (HDOH, 2006).

Remnants of the Kōloa irrigation system, including mill settling basins, siphons, ditches, and flumes remain in the landscape of the project area. Ditches, flumes, ponds, and reservoirs that are used solely for irrigation, do not overflow into any other regulated waters, are not defined as "Waters of the U.S." in 40 CFR Part 122.2, and are not designated as "State Waters" in the Hawaii Revised Statutes §342D-1, are not regulated under the Clean Water Act and Hawaii Administrative Rules §11-54. However, while the irrigation system itself may not be considered "waters of the U.S." or "State Waters," the policy of water quality antidegradation in HAR §11-54-1 has been established to ensure that activities do not degrade the water quality of regulated waterbodies, such as Waikomo Stream or the Pacific Ocean. Project planning must take into consideration that an old irrigation system may carry flowing waters during heavy rainfall events and this flow has the potential to provide a connection to natural waterbodies in the watershed.

No aquatic habitats are present in the project area since all "water features" along proposed routes are normally dry irrigation ditches. Standing water at the proposed facility site east of Kōloa Sugar Mill (Fig. 5, above) is a temporary impoundment providing, at most, limited breeding habitat for aquatic insects such as mosquitoes. No state or federally listed endangered or threatened (DLNR, 1998; Federal Register, 2005; USFWS, 2005, 2009a) or native migratory (amphidromous) aquatic species were observed in the Project area during the January 2009 site visit.

A Best Management Practices (BMP) plan should be developed and implemented to minimize environmental impacts to water quality and aquatic biota downslope from the project sites.

Invertebrate Resources

Two subterranean invertebrate species present within the greater Kōloa-Po'ipū-Kukui'ula area are listed as endangered under both the Federal and State of Hawai'i endangered species statutes. These are the Kauai cave wolf spider (*Adelocosa anops*) and the Kauai cave amphipod (*Spelaeorchestia koloana*). The USFWS has designated 14 Critical Habitat units for these two species in the greater Kōloa-Po'ipū-Kukui'ula area (Federal Register, 2003). Three of these units (Nos. 4, 10 and 12) are located relatively close to portions of the project. Only one unit (No. 10) is immediately adjacent to any part of the proposed project (Fig. 6).

No subterranean invertebrate survey was conducted for the Project, as the biologists and archaeologists that surveyed the site were unable to locate any cave or lava tube openings within the various rights-of-way investigated. If, during construction activity, a lava tube or cave is broken into then a survey of that void will need to be conducted immediately. A set of lava tube/cave break-in guidelines and procedures will be prepared prior to the initiation of construction to ensure that impacts to any archaeological, cultural or natural resource components potentially present is minimized to the maximum extent practicable.

Avian Resources

The findings of the avian survey are consistent with the findings of at least five other avian surveys conducted on lands immediately adjacent to portions of the proposed wastewater collection system in the recent past (David 2003a, 2005a, David and Guinther 2006, 2009), as well as with the results of several other avian surveys conducted in the Kōloa-Po'ipū area in the recent past (David 2002, 2004a, 2004b, 2005b, 2005c, 2007, David and Guinther 2005)

Of the 29 avian species detected during the course of this survey only three are native to the Hawaiian Islands. One of these, Hawaiian Goose (Nēnē), is listed as an endangered species under both Federal and State of Hawai'i endangered species statutes. Two pairs were seen on the ground several hundred yards south of the Kōloa Mill. All four of these birds were banded, and I was able to read the band numbers – one pair yellow-158 and mate yellow-354 were both



Figure 6. Designated Critical Habitat Units 1-12 in the project vicinity.

banded as goslings at Kauai Lagoons. Yellow-158 was moved to Grove Farm on March 3, 2008, its mate was banded on April 6, 2008, but was left at Kauai Lagoons. Yellow-054 was banded as a gosling at the Wailua Golf Course on January 29, 2007, its mate yellow-361 was banded as a gosling at the Kiahuna Golf Course on April 23, 2008. These two pair have lately nested close to Waitā Reservoir, which is located less than a 1000-meters due north from the location in which I saw the birds. It is likely that these pairs and an additional nine Nēnē which flew over one of my count station located at 453691 mE-242054mN which is located along the wastewater collection line connecting the Crater Pump Station with the Villages Pump station, east of the Kōloa Bypass Road, were attracted to the fallow corn fields located south of the Kōloa mill on Grove Farm property.

Two other species detected, White-tailed Tropicbird and Pacific Golden-Plover are indigenous, the former is an indigenous breeding species and the later is an indigenous migratory species. A lone White-tailed Tropicbird was seen flying over the Kōloa Mill towards the mountain range separating Kōloa from Nāwilliwili, possibly the area in which this bird nests. White-tailed Tropicbirds are a pelagic seabird species, that come to land only to breed, nest and raise their young. On Kaua'i they usually nest on rocky inaccessible cliffs—this species is regularly seen soaring over inland areas on Kaua'i on a seasonal basis. Several Pacific Golden-Plover were seen along roadways and in the more open areas within the general project area. This species is a migratory shorebird species that nests in the High Arctic, returning to warmer central and Tropical Pacific climes where they spend the fall, winter and early spring. They usually leave Hawai'i for their trip back to the Arctic in late April or the very early part of May each year. The remaining 26 species detected are regularly encountered alien species, common in the low to mid-elevation areas the Island of Kaua'i.

Although not detected during this survey, it is probable that the Hawaiian endemic sub-species of the Short-eared Owl (*Pueo* or *Asio flammeus sandwichensis*) use resources in the general project area, as they are regularly seen foraging over open fields in the low-to-mid elevation areas on the Island (David, 2009).

Two other species not detected during this survey, Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened endemic sub-species of the Newell's Shearwater (*Puffinus auricularis newelli*) have been recorded overflying the project site between April and the end of November each year (David et al., 2002; David, 2003b). Additionally, the Save Our Shearwaters Program has recovered both species from the general project area on an annual basis over the past three decades (Morgan et al., 2003, 2004; David and Planning Solutions, 2008; SOS, 2009).

The petrel is listed as endangered, and the shearwater as threatened under both Federal and State of Hawaii endangered species statutes. The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters 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 of these 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, 1994; Podolsky et al., 1998; Ainley et al., 2001).

There are no nesting colonies nor appropriate nesting habitat for either of these listed seabird species within or close to any portion of the proposed project. The two closest historically known Newell's Shearwater colonies to any portion of the project are, or were, located at Kāluahonu and above Kalāheo; the former colony is located approximately 3500 m (2.2 mi) northeast of the northeastern most portion of the proposed project, and the later is located more than 8500 m (5.3 mi) northwest of the most northeastern point on the project. It is currently thought that the Kāluahonu colony is no longer extant as no birds have been recorded there in over six years (David et al., 2002; David, 2003c; DOFAW, 2009); it is unclear as to whether the Kalāheo colony is still extant (David et al., 2002). The only presently known Hawaiian Petrel colonies are located in remote valleys, inland from the north, and northeast shores of the Island of Kaua'i.

Mammalian Resources

The findings of the mammalian survey are consistent with the findings of at least five other avian surveys conducted on lands immediately adjacent to portions of the proposed wastewater collection system in the recent past (David 2003a, 2005a; David and Guinther, 2006, 2009), as well as with the results of several other avian surveys conducted in the Kōloa-Po'ipū area in the recent past (David 2002, 2004a, 2004b, 2005b, 2005c, 2007; David and Guinther, 2005).

Although no Hawaiian hoary bats were detected during the course of this survey, bats have been recorded foraging for insects within the general project area in the recent past (David, 2009). Hawaiian hoary bats are widely distributed in the lowland areas on the Island of Kaua'i, and have been

documented in and around almost all areas that still have some dense vegetation (Tomich, 1986; USFWS, 1998; David, 2009).

Although no rodents were detected during the course of this survey, it is likely that the four established alien muridae found on Kaua'i, 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 project area. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependant on them.

Glossary

Alien - Introduced to Hawai'i by humans.

Amphidromous – Aquatic species that live and breed in fresh water as adults, and the larvae or juvenile stage develops in the ocean, migrating back from the ocean into a stream.

Crepuscular – Twilight hours either in the evening or the morning.

Endemic – Native and unique to the Hawaiian Islands.

Endangered – Listed and protected under the ESA as an endangered species.

Indigenous - Native to Hawai'i, but also found elsewhere naturally.

Muridae – Rodents, including rats, mice and voles, one of the most diverse families of mammals.

Nocturnal – Night-time, after dark.

Pelagic – An animal that spends it's life at sea – in the case of seabirds only returning to land to nest.

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.

Volant – Flying, capable of flight - as in flying insect.

Threatened - Listed and protected under the ESA as a threatened species.

ESA – Federal Endangered Species Act of 1973, as amended.

DLNR – Hawaii State Department of Land & Natural resources.

USFWS – U.S. Fish & Wildlife Service.

References Cited

- AECOS, Inc. (AECOS). 1995. Environmental Reconnaissance Survey of Lower Waikomo Stream, for the Hoonani Road Bridge, Poipu, Kauai. Prep. for Belt Collins Hawaii. AECOS No. 826: 15 pp.
- _____. 1994. Environmental Reconnaissance Survey of Waihohonu Stream, Koloa, Kaua'i. Prep. for Wilson Okamoto & Associates. AECOS No. 782: 14 pp.
- _____. 2009. Biological and water quality survey of Ōma'o Stream for the Northern Leg of the Western Bypass Road, Kōloa, Kaua'i. Prep. for Wilson Okamoto & Associates. AECOS No. 1183: 13 pp.
- Ainley, D. G., R. Podolsky, L. Deforest, G. Spencer, and N. Nur. 2001. The Status and Population Trends of the Newell's Shearwater on Kaua'i: Insights from Modeling, in: Scott, J. M., S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna*. Studies in Avian Biology No. 22: Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. (Pg. 108-123).
- American Ornithologist's Union. 1998. *Check-list of North American Birds*. 7th edition. AOU. Washington D.C. 829pp.
- _____. 2000. Forty-second supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 117:847-858.
- Banks, R. C., C. Cicero, J. L. Dunn, A. W. Kratter, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2002. Forty-third supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk, 119: 897-906.
- _____. 2003 Forty-fourth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk, 120: 923-931.
- _____. 2004 Forty-fifth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk, 121: 985-995.
- _____. 2005 Forty-sixth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk, 122: 1031-1031.

- Banks, R. C., C. Cicero, J. L. Dunn, A. W. Kratter, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2006 Forty-seventh supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk, 123: 926-936.
- _____, C. R. Terry Chesser, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2007 Forty-eighth supplement to the American Ornithologist Union *Check-list of North American Birds*. Auk, 124: 1109-1115.
- _____, _____, _____, _____, _____, _____, and K. Winker. 2008 Forty-ninth supplement to the American Ornithologist Union *Check-list of North American Birds*. Auk, 125: 758-768.
- Benson, L. 1982. *The cacti of the United States and Canada*. Stanford Univ. Press, Palo Alto. 1044 pp.
- Cooper, B. A and R. H. Day. 1994. Kauai endangered seabird study. Volume 1: Interactions of Dark-rumped Petrels and Newell's Shearwaters with utility structures on Kauai, Hawaii: Final Report. Electric Power Research Institute, Palo Alto, CA. TR-105847-V1.
- _____, and _____. 1998. Summer Behavior and Mortality of Dark-rumped Petrels and Newell's Shearwaters at Power Lines on Kauai. *Colonial Waterbirds*, 21(1): 11-19.
- David, R. E. 2002. A Survey of Avian and Terrestrial Mammalian Species Conducted on the Kukui 'ula Project Site Koloa District, Kaua'i. Prepared for DMB Associates, Inc.
- _____. 2003a. A Survey of Avian and Terrestrial Mammalian Species Conducted for the Proposed Koloa Western Bypass Road, Koloa District, Island of Kaua'i. Prepared for: DMB and Associates, Inc. and Kaua'i County Department of Transportation, Highways Division.
- _____. 2003b. Results of a Survey of the Newell's Shearwater Colony at Kaluahonu, Island of Kaua'i, Hawai'i, July 2003. Prepared for Planning Solutions, Inc., and Kaua'i Island Utility Cooperative.
- _____. 2004a. A Survey of Avian and Terrestrial Mammalian Species for the Kukui'ula Gap/Employee Housing Site, Kōloa District, Island of Kaua'i. Prep. for Kukui'ula Development Company (Hawaii), LLC.

- David, R. E. 2004b. A Survey of Avian and Terrestrial Mammalian Species: Poi'pū Roundabout, Kōloa District, Island of Kaua'i. Prep. for Kukui'ula Development Company (Hawaii), LLC.
- _____. 2005a. A Survey of Avian and Terrestrial Mammalian Species Conducted for the Kukui'ula Development Offsite Portion of the Western Bypass Road, Kōloa District, Island of Kaua'i. Prep. for Kukui'ula Development Company (Hawaii), LLC.
- _____. 2005b. A Survey of Avian and Terrestrial Mammalian Species Conducted for the Proposed Kukui'ula, Development Company L.L.C. Borrow Pit, Kōloa District, Island of Kaua'i. Prepared for: Kukui'ula Development Company (Hawaii), LLC.
- _____. 2005c. A Survey of Avian and Terrestrial Mammalian Species Conducted for the Proposed Non-Potable Water System, Kukui'ula, Kōloa District, Island of Kaua'i. Prep. for Kukui'ula Development Company (Hawaii), LLC.
- _____. 2007. A Survey of Botanical, Avian and Terrestrial Mammalian Species for a Proposed Electrical Substation, Kukui'ula, Kōloa District, Island of Kaua'i. Prep. for Kukui'ula Development (Hawaii), Inc.
- _____. 2008. Unpublished field notes – Kaua'i, 1980 - 2008.
- _____, R. H. Day, and B. A. Cooper 2002. Results of Newell's Shearwater Surveys at the Kaluahonu, Moalepe and Anahola Memorial Colonies, Island of Kaua'i, Hawaii'i, July 2002. Prep. for Planning Solutions, Inc., and Kaua'i Electric.
- _____ and E. B. Guinther. 2005. A Survey of Botanical, Avian and Terrestrial Mammalian Species Conducted Within the Conservation District, Kukui'ula, Kōloa District, Island of Kaua'i. Prep. for Kukui'ula Development Company (Hawaii), LLC.
- _____ and _____. 2006. A Survey of Botanical, Avian and Terrestrial Mammalian Species Conducted for a Proposed Sewer Line Along Po'ipū Road, Kōloa District, Island of Kaua'i. Prep. for Kukui'ula Development Company Hawaii.
- _____ and _____. 2009. Biological Surveys Conducted for the Northern Leg of the Western Bypass, Kōloa District, Island of Kaua'i. Prep. for Wilson

- Okamoto Corporation and the County of Kauai, Department of Public Works.
- David, R. E. and Planning Solutions. 2008. 2007 Save Our Shearwaters Program End of Year Report. Prep. for Kaua'i Island Utility Cooperative & The Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife.
- Department of Land and Natural Resources (DLNR). 1998. Indigenous wildlife, endangered and threatened wildlife and plants, and introduced wild birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rules §13-124-1 through §13-124-10, with Exhibits.
- _____. Division of Aquatic Resources (DLNR-DAR). 2009. Atlas of Hawaiian Watershed & Their Aquatic Resources. Island of Kaua'i, Koloa Watersheds, Waikomo Stream. Available online at URL: <http://www.hawaiiwatershedatlas.com/watersheds/kauai/23002.pdf>; last accessed February 4, 2009.
- _____. Division of Forestry & Wildlife (DOFAW). 2009. Unpublished Seabird Survey Data.
- Federal Register. 2003. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Kauai Cave Wolf Spider and Kauai Cave Amphipod; Final Rule. *Federal Register*, 68(Wednesday, April 9, 2003): 17430-17470
- Federal Register. 2005. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Review of Species that are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petition; Annual Description of Progress on Listing Actions. *Federal Register*, 70 No. 90 (Wednesday, May 11, 2005): 24870-24934.
- Hadley, T. H. 1961. Shearwater calamity on Kauai. *Elepaio*, 21: 60.
- Hawai'i Department of Health (HDOH). 2006. State of Hawaii Water Quality Monitoring and Assessment Report. 279 pp.
- Morgan, C., P. White, and R. E. David. 2003. Habitat Conservation Plan: Kaua'i Island Utility Cooperative: Working Paper No. 2 - Data Analysis: Interpreting the Save Our Shearwaters Bird Recovery Database (1979-

- 2002) for Habitat Conservation Planning. Prep. for Kaua'i Island Utility Cooperative.
- Morgan, C., P. White, and R. E. David. 2004 Habitat Conservation Plan: Kaua'i Island Utility Cooperative: Data Report and Analysis: Save Our Shearwaters Bird Program 2003 Update. Prep. for Kaua'i Island Utility Cooperative.
- Palmer, D. D. 2003. *Hawai'i's ferns and fern allies*. University of Hawaii Press, Honolulu. 324 pp.
- Podolsky, R., D.G. Ainley, G. Spencer, L. de Forest, and N. Nur. 1998. Mortality of Newell's Shearwaters Caused by Collisions with Urban Structures on Kaua'i. *Colonial Waterbirds*, 21: 20-34.
- Pukui, M. K., S. H. Elbert, and E. T. Mookini 1976. *Place Names of Hawaii*. University of Hawaii Press, Honolulu. 289 pp.
- Reed, J. R., J. L. Sincock, and J. P. Hailman 1985. Light Attraction in Endangered Procellariiform Birds: Reduction by Shielding Upward Radiation. *Auk*, 102: 377-383.
- Save our Shearwater Program (SOS). 2009. Unpublished 2008 data.
- Simons, T. R., and C. N. Hodges. 1998. Dark-rumped Petrel (*Pterodroma phaeopygia*). In: A. Poole and F. Gill (editors). *The Birds of North America*, No. 345. The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists Union, Washington, D.C.
- Sincock, J. L. 1981. Saving the Newell 's Shearwater. P. 76-78, in: *Proceedings of the Hawaii Forestry and Wildlife Conference, 2-4 October 1980*. Department of Land and Natural Resources, State of Hawaii, Honolulu.
- Staples, G. W. and D. R. Herbst. 2005. *A Tropical Garden Flora. Plants Cultivated in the Hawaiian Islands and other Tropical Places*. Bishop Museum, Honolulu. 908 pp.
- Telfer, T. C. 1979. Successful Newell's Shearwater Salvage on Kauai. *'Elepaio*, 39: 71
- _____, J. L. Sincock, G. V. Byrd, and J. R. Reed. 1987. Attraction of Hawaiian seabirds to lights: Conservation efforts and effects of moon phase. *Wildlife Society Bulletin*, 15: 406-413.

- TenBruggencate, J. 2007. Kaua'i Stream Hits Dry Spell. Honolulu Advertiser, August 19, 2007. Available online at URL: <http://www.honoluluadvertiser.com/section/backissuesfront>; last accessed February 24, 2009.
- Timbol, A. S. and J. A. Maciolek. 1978. Stream channel modification in Hawaii, Part A: Statewide inventory of streams, habitat factors and associated biota. U. S. Fish and Wildlife Service, FWS/OBS-78/16. 158 pp.
- Tomich, P. Q. 1986. *Mammals in Hawaii*. Bishop Museum Press, Honolulu. 37 pp.
- U.S. Army Corps of Engineers (USACE). 1987. *Corps of Engineers Wetland Delineation Manual*. Environmental Laboratory, Dept. of the Army, Waterways Experiment Station, Corps of Engineers. Tech. Rept. Y-87-1.
- U.S. Fish & Wildlife Service (USFWS). 1983. Hawaiian Dark-Rumped Petrel & Newell's Manx Shearwater Recovery Plan. USFWS, Portland, Oregon. February 1983.
- _____. 1998. Recovery Plan for the Hawaiian Hoary Bat. U.S. Fish & Wildlife Service, Portland, Oregon.
- _____. 2005. Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12 (Tuesday, November 1, 2005).
- _____. 2009a. Threatened and Endangered Species System (TESS). Available online at URL: http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrence.jsp?state=HI; last accessed February 12, 2009.
- _____. 2009b. National Wetlands Inventory. Wetlands Mapper. Available at URL: <http://www.fws.gov/wetlands/Data/mapper.html>; last visited February 26, 2009.
- Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1990. *Manual of the Flowering Plants of Hawai'i*. University of Hawaii Press, Honolulu. 1854 pp.
- _____ and _____. 1999. *Supplement to the Manual of the flowering plants of Hawai'i*. Pages 1855-1918, in: Wagner, W. L., D. R. Herbst, and S. H. Sohmer, *Manual of the flowering plants of Hawai'i*. Revised edition. 2 vols. University of Hawaii Press and Bishop Museum Press, Honolulu.

Appendix D

*Archaeological Inventory Survey for the Proposed Koloa-Poipu
Regional Wastewater Reclamation Facility and Collection
System, Koloa, Weliweli, and Paa Ahupuaa, Koloa District,
Island of Kauai*

Cultural Surveys Hawaii, Inc.

March 2009

DRAFT

Archaeological Inventory Survey
for the proposed Kōloa-Po'ipū Regional Wastewater
Reclamation Facility and Collection System,
Kōloa, Weliweli, and Pa'a Ahupua'a, Kōloa District,
Island of Kaua'i

TMK: [4] 2-8-004: por. 003; [4] 2-8-008: por. 001 & por. 036; [4] 2-8-009: por. 001; [4] 2-8-011: por. 001; [4] 2-8-014: por. 005, por. 019, por. 023, por. 030, & por. 037; [4] 2-8-022: por. 001, por. 011, por. 021, & por. 030; [4] 2-9-001: por. 001

Prepared for
Wilson Okamoto Corporation

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Management Summary

Reference	Archaeological Inventory Survey for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System, Kōloa, Weliweli, and Pa'a Ahupua'a, Kōloa District, Island of Kaua'i (Tulchin & Hammatt 2009)
Date	March 2009
Project Number (s)	Cultural Surveys Hawai'i Inc. (CSH) Job Code: KOLOA 28
Investigation Permit Number	Fieldwork in this report has been performed under CSH's annual archaeological research permit, No. 09-20, issued by DLNR / SHPD.
Land Jurisdiction	The project area is predominantly situated in private lands owned by Grove Farm and the E.A Knudsen Trust, with smaller parcels belonging to various private land owners or the County of Kaua'i.
Agencies	State of Hawai'i Department of Land and Natural Resources / State Historic Preservation Division (DLNR / SHPD)
Project Description	<p>HOH Utilities, LLC proposes to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region on the south shore of the Island of Kaua'i. The proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility (Regional WRF) and collection system (hereinafter collectively referred to as the "project area") is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.</p> <p>The proposed wastewater collection system improvements would consist of four (4) wastewater pump stations (Kōloa WWPS, Villages WWPS, Crater WWPS, and Eastern WWPS) along with gravity lines and force mains situated within existing undeveloped lands, roadways or along established utility line corridors or unpaved roadway corridors within a predominantly agricultural area.</p> <p>Associated ground disturbance will include excavation related to the project area's development, to include: structural footings, utility installation, as well as roadway and parking area installation.</p>
Project Location	<p>The project area is located on the south shore of the Island of Kaua'i in the Kōloa District. The new Regional WRF will be situated within an agricultural area utilizing a portion of the existing Kōloa Mill site. This site is located at the eastern end of Weliweli Road in Kōloa Town, and consists of Tax Map Key (TMK): [4] 2-09-001: portions of 001 and 002.</p> <p>The wastewater collection system serving the new Regional WRF is planned to consist of three (3) components: 1.) The Kōloa Collection</p>

	<p>System, 2.) The Po'ipū Collection System, and 3.) The Eastern Collection System.</p> <p>New sewer lines associated with the Kōloa Collection System would be routed within both privately-owned property and the rights-of-way for portions of County roadways which are Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road. Privately-owned properties affected include parcels associated with Tax Map Keys (TMKs): 2-08-004: portion of 003, 2-08-008: portion of 001 and 036 (Yamada Road), 2-08-009: portion of 001, and 2-08-011: portion of 001, 2-08-014: portion of 023, and 2-08-022: portion of 001. A new wastewater pump station (Kōloa WWPS) would also be provided near the intersection of Waikomo Road with Weliweli Road, identified as TMK 2-08-011: portion of 001.</p> <p>The Po'ipū Collection System will involve the construction of two (2) new wastewater pump stations. The Villages WWPS is proposed to be located within an undeveloped site just <i>mauka</i> of the existing Kiahuna Swim and Tennis Club facility and east of Hapa Road within a parcel identified as TMK: (4) 2-08-014: portion of 019. The Crater WWPS is proposed to be located within an undeveloped site east of the existing water tanks near Puuhi Reservoir within a parcel identified as TMK: (4) 2-09-001: portion of 001.</p> <p>The Eastern Collection System will involve the construction of one (1) new wastewater pump station. The Eastern WWPS is proposed to be located within an undeveloped site located east of the Po'ipū Bay Golf Course and <i>mauka</i> of the private road that extends eastward from Po'ipū Road within a parcel identified as TMK: (4) 2-09-001: portion of 001.</p> <p>Sewer lines associated with the Po'ipū and Eastern Collection Systems would predominantly be located within privately owned property and a few County roadways. These properties are identified as TMKs: (4) 2-08-014: portions of 005 (Kiahuna Plantation Drive), 019, 030, and 037; (4) 2-08-022: portions of 011, 021, and 030; (4) 2-09-001: portion of 001.</p> <p>The entire project area is depicted on the 1996 Kōloa U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.</p>
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Project Acreage	The proposed Regional WRF and 4 wastewater pump stations total an approximate area of 10 acres. The project also includes an approximately 5-mile long and 10 ft wide corridor, proposed for the <u>instillation of gravity lines and force mains.</u>
Land Jurisdiction	The project area is predominantly situated in private lands owned by Grove Farm and the E.A Knudsen Trust, with smaller parcels belonging to various private land owners or the County of Kaua'i.
Area of Potential Effect (APE) and Survey Acreage	Based on available information, the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System project will not impose adverse visual, auditory or other environmental impact to any known historic properties, including standing architecture, located outside the project area. Accordingly, the proposed project, based on available information lacks potential to affect historic properties outside the project area. As a result the project's APE is the same as the project area. The survey area for the current investigation included the entire approximately 10 acres of land proposed for waste water treatment plant and pump station development as well as the 5 mile long and 10 ft wide corridor proposed for transmission line instillation, all of which constitute the APE/project area.
Historic Preservation Regulatory Context	At the request of Wilson Okamoto Corporation, CSH undertook this archaeological inventory survey. In consultation with SHPD, the inventory survey investigation was designed to fulfill the state requirements for archaeological inventory surveys (HAR Chapter 13-276). This document was prepared to support the proposed project's historic preservation review under Hawaii Revised Statutes (HRS) Chapter 6E-42 and HAR Chapter 13-284.
Fieldwork Effort	Missy Kamai, B.A., and Gerald Ida, B.A., conducted the fieldwork effort, which required 10 person-days to complete. Fieldwork took place between January 12th and 16 th 2009 under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator).
Number of Historic Properties Identified	<p>Three:</p> <ul style="list-style-type: none"> • State Inventory of Historic Properties (SIHP) #50-30-10-954, pre-contact habitation enclosure, terrace, and platform • SIHP #50-30-10-955, pre-contact habitation platform • SIHP #50-30-10-992, post-contact dirt road with parallel stacked stone boundary walls

Historic Properties Recommended Eligible to the Hawai'i Register of Historic Places (Hawai'i Register)	SIHP #50-30-10-954, pre-contact habitation enclosure, terrace, and platform SIHP #50-30-10-955, pre-contact habitation platform SIHP #50-30-10-992, post-contact dirt road with parallel stacked stone boundary walls
Historic Properties Recommended Ineligible to the Hawai'i Register	None
Effect Recommendation	CSH's project specific effect recommendation is "effect, with proposed mitigation commitments." The recommended mitigation measures will reduce the project's effect on identified significant surface historic properties as well as any yet to be identified subsurface historic properties that may be located within the project area and be pro-active in addressing possible community concerns.
Mitigation Recommendation	No further historic preservation work is recommended for SIHP #50-30-10-954 and SIHP #50-30-10-955. Sufficient information regarding the location, function, age, and construction methods of SIHP #50-30-10-954 and SIHP #50-30-10-955 have been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities. It is recommended that a cultural resource preservation plan be prepared for the proposed -Po'ipū Regional Wastewater Reclamation Facility and Collection System project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP #50-30-10-992 located within the southwestern portion of the project area as well as SIHP #50-30-10-947 and SIHP #50-30-10-953, which are located in the immediate vicinity of the southwestern portion of the project area. This preservation plan should detail the short and long term preservation measures that will safeguard the historic properties during project construction and subsequent use of the project area. Based on background research, it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area. In order to mitigate the potential damage to these potential historic properties within the <i>makai</i> portion of the project area, it is recommended that project construction proceed under an archaeological monitoring program. This monitoring program will facilitate the identification and proper treatment of any

	burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered. The specifics archaeological monitoring will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division. Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility. A review of historic documents indicates that this building was constructed by at least 1912 as a component of the Koloa Plantation. Due to the historic nature of these structures CSH recommends consultation with the State Historic Preservation Division Architecture Branch prior to any land disturbance associated with the construction of the proposed Regional WRF.
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Section 1 Introduction

1.1 Project Background

At the request of Wilson Okamoto Corporation, Cultural Surveys Hawaii, Inc. (CSH) conducted an archaeological inventory survey for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System project, located in the *ahupua'a* of Kōloa, Weliweli, and Pa'a, Kōloa District, Island of Kaua'i.

HOH Utilities, LLC proposes to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region on the south shore of the Island of Kaua'i. The proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility (Regional WRF) and collection system (hereinafter collectively referred to as the "project area") is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.

The proposed wastewater collection system improvements would consist of four (4) wastewater pump stations (Kōloa WWPS, Villages WWPS, Crater WWPS, and Eastern WWPS) along with gravity lines and force mains situated within existing undeveloped lands, roadways or along established utility line corridors or unpaved roadway corridors within a predominantly agricultural area.

Associated ground disturbance for the proposed project will include excavation related to the project area's development, to include: structural footings, utility installation, as well as roadway and parking area installation.

The project area is located on the south shore of the Island of Kaua'i in the Kōloa District. The new Regional WRF will be situated within an agricultural area utilizing a portion of the existing Kōloa Mill site. This site is located at the eastern end of Weliweli Road in Kōloa Town, and consists of Tax Map Key (TMK): [4] 2-09-001: portions of 001 and 002.

The wastewater collection system serving the new Regional WRF is planned to consist of three (3) components: 1.) The Kōloa Collection System, 2.) The Po'ipū Collection System, and 3.) The Eastern Collection System.

New sewer lines associated with the Kōloa Collection System would be routed within both privately-owned property and the rights-of-way for portions of County roadways which are Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road. Privately-owned properties affected include parcels associated with Tax Map Keys (TMKs): 2-08-004: portion of 003, 2-08-008: portion of 001 and 036 (Yamada Road), 2-08-009: portion of 001, and 2-08-011: portion of 001, 2-08-014: portion of 023, and 2-08-022: portion of 001. A new wastewater pump station (Kōloa WWPS) would also be provided near the intersection of Waikomo Road with Weliweli Road, identified as TMK 2-08-011: portion of 001.

The Po'ipū Collection System will involve the construction of two (2) new wastewater pump stations. The Villages WWPS is proposed to be located within an undeveloped site just *mauka* of the existing Kiahuna Swim and Tennis Club facility and east of Hapa Road within a parcel identified as TMK: (4) 2-08-014: portion of 019. The Crater WWPS is proposed to be located

within an undeveloped site east of the existing water tanks near Puuhi Reservoir within a parcel identified as TMK: (4) 2-09-001: portion of 001.

The Eastern Collection System will involve the construction of one (1) new wastewater pump station. The Eastern WWPS is proposed to be located within an undeveloped site located east of the Po'ipū Bay Golf Course and *mauka* of the private road that extends eastward from Po'ipū Road within a parcel identified as TMK: (4) 2-09-001: portion of 001.

Sewer lines associated with the Po'ipū and Eastern Collection Systems would predominantly be located within privately owned property and a few County roadways. These properties are identified as TMKs: (4) 2-08-014: portions of 005 (Kiahuna Plantation Drive), 019, 030, and 037; (4) 2-08-022: portions of 011, 021, and 030; (4) 2-09-001: portion of 001.

The entire project area is depicted on the 1996 Kōloa U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle and a composite of Tax Map Keys (TMK) [4] 2-8 and [4] 2-9 (Figure 1 & Figure 2)

The proposed Regional WRF and 4 wastewater pump stations total an approximate area of 10 acres. The project also includes an approximately 5-mile long and 10 ft wide corridor, proposed for the installation of gravity lines and force mains. The project area is predominantly situated in private lands owned by Grove Farm and the E.A Knudsen Trust, with smaller parcels belonging to various landowners'.

Based on available information, the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System project will not impose adverse visual, auditory or other environmental impact to any known historic properties, including standing architecture, located outside the project area. Accordingly, the proposed project, based on available information lacks potential to affect historic properties outside the project area. As a result the project's APE is the same as the project area. The survey area for the current investigation included the entire approximately 10 acres of land proposed for the Regional WRF and wastewater pump station development as well as the 5 mile long and 10 ft wide corridor proposed for gravity lines and force mains, all of which constitute the APE/project area.

1.2 Historic Preservation Regulatory Context and Document Purpose

As a privately funded venture on private lands, the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System project is a "project" subject to state of Hawai'i historic preservation review legislation (Hawaii Revised Statutes [HRS] Chapter 6E-42 and Hawai'i Administrative Rules [HAR] Chapter 13-284). Based on the project's scope, cultural setting, and the results of previous cultural resource management investigations in the vicinity, Wilson Okamoto Corporation had this archaeological inventory survey investigation completed. This investigation was carried out as part of and in compliance with the proposed development's historic preservation review.

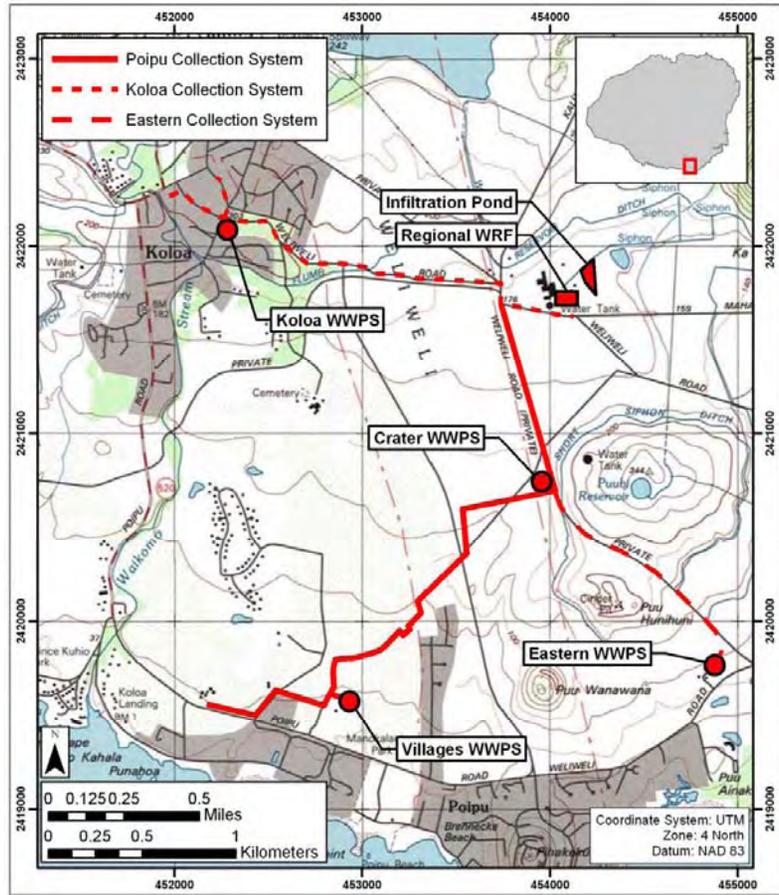
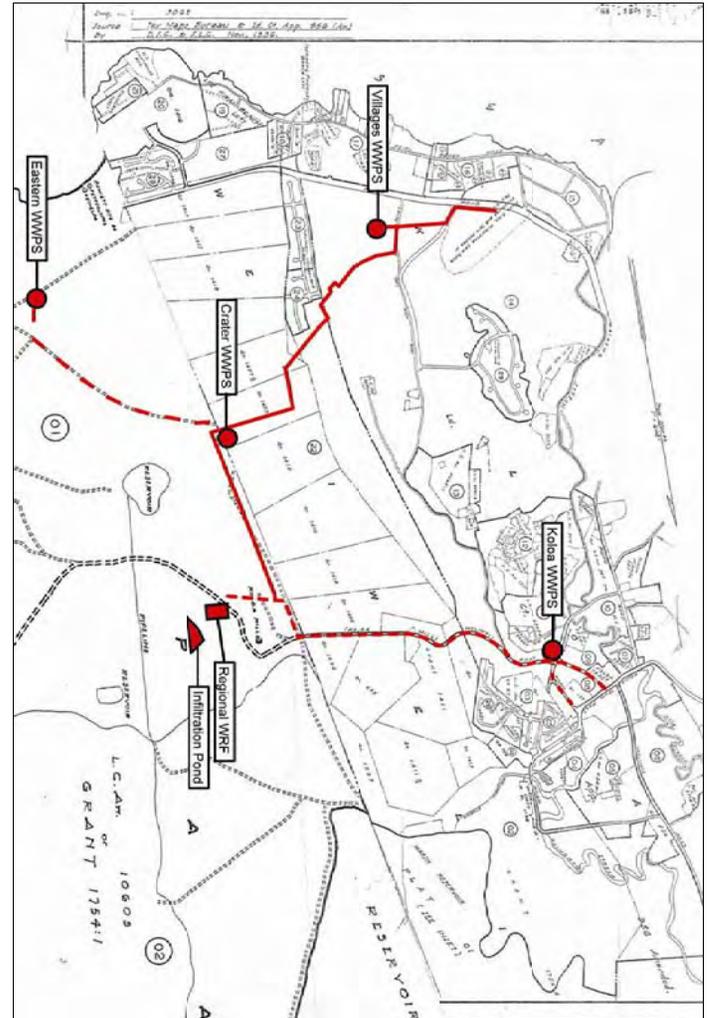


Figure 1. USGS 7.5 Minute Series Topographic Map, Kōloa Quadrangle (1996), showing the location of the project area

Figure 2. Composite of Tax Map Key [4] 2-8 (top half) and [4] 2-9 (bottom half) showing project area location



Under Hawai'i state historic preservation legislation, archaeological inventory surveys are designed to identify, document, and provide significance and mitigation recommendations for historic properties. Under this legislation, historic properties are defined as any "building, structure, object, district, area, or site, including *heiau* and underwater site, which is over fifty years old." A project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties determined eligible, based on established significance criteria, for inclusion in the Hawai'i Register of Historic Places [Hawai'i Register]). Determinations of eligibility to the Hawai'i Register result when a state agency official's historic property "significance assessment" is approved by the State Historic Preservation Division (SHPD), or when SHPD itself makes an eligibility determination for an historic property (HAR Chapter 13-284).

In consultation with SHPD, this inventory survey investigation was designed to fulfill the state requirements for archaeological inventory surveys (HAR Chapter 13-276). This inventory survey report was prepared to support the proposed project's historic preservation review. The report includes a project-specific effect recommendation and mitigation recommendations for the project area's historic properties that are recommended eligible to the Hawai'i Register. This document is intended to support project-related historic preservation consultation among state agencies and interested Native Hawaiian and community groups.

1.3 Scope of Work

The archaeological inventory survey and its accompanying report will document all historic properties within the subject parcel. The prepared inventory survey will be in compliance with state standards and will be submitted for review and approval to the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR).

The following steps will satisfy the State and County requirements for an archaeological inventory survey:

1. A ground survey of the entire project area for the purpose of historic property identification and documentation. All historic properties would be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation will include photographs and scale drawings of selected historic properties. All historic properties will be assigned *Inventory of Historic Properties* numbers by the State and located with a Trimble GPS. This GPS data will be in the report in ArcGIS format and be sufficient for planning purposes.
2. Research on historic and archaeological background, including search of historic maps, written records, and Land Commission Award documents. This research will focus on the specific area with general background on the *ahupua'a* and district and will emphasize settlement patterns.
3. Appropriate consultation with knowledgeable members of the community, requesting information on historic properties in the project area.
4. Preparation of a survey report which will include the following:
 - a. A topographic map of the survey area showing all historic properties;

- b. Results of consultation with knowledgeable community members about the property's past land use and historic properties.
- c. Description of all historic properties with selected photographs, scale drawings, and discussions of function;
- d. Historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the project area's historic properties;
- e. A summary of historic property categories and their significance in an archaeological and historic context;
- f. Recommendations based on all information generated that will specify what steps should be taken to mitigate impact of development on the project area's significant historic properties - such as data recovery (excavation) and preservation of specific areas. These recommendations will be developed in consultation with the client and the State agencies.

This scope of work also includes full coordination with the State Historic Preservation Division (SHPD), and County relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

1.4 Environmental Setting

1.4.1 Natural Environment

The project area ranges from approximately 10 m (32 ft) to 3 km (1.9 miles) north of the coast, and ranges from approximately 317 m (0.2 miles) to 3.2 km (2 miles) east of Waikomo Stream.

The project area receives 40 to 91 inches (1000 to 1500 millimeters) of rainfall per year, falling mostly in the winter months (November through March) (Giambelluca et al. 1986:86). Temperatures range from highs around 90°F to maximum lows of about 50°F, with the greatest variations occurring between day and night rather than winter and summer.

Observed vegetation within the project area consisted of cacti, *koa haole* (*Leucaena leucocephala*), buffelgrass (*Pennisetum ciliare*), and java plum (*Syzygium cumini*).

Lands within the project area are relatively level with elevations ranging from 15 to 200 ft above mean sea level (AMSL). According to U.S. Department of Agriculture (USDA) soil survey data the sediments within the project area consist primarily of Waikomo clay (Wt & Ws) and Koloa clay (KvB & KvC), with a small pocket of Fill land (Fd) within the middle of the proposed Kōloa Collection System (Foote et al. 1972) (Figure 3). The Waikomo series consists of "well-drained, stony and rocky soils on uplands...developed in material weathered from basic igneous rock, probably with a mixture of ash and alluvium in places...used for sugarcane, pasture, wildlife habitat, and homesites" (Foote et al. 1972). The Koloa series consists of "well-drained soils on slopes of old volcanic vents and upland ridges on ... underlain by hard rock at a depth of 20 to 40 inches...developed in material weathered from basic igneous rock...used for irrigated sugarcane" (Foote et al. 1972). Fill land consists of "areas filled with material from

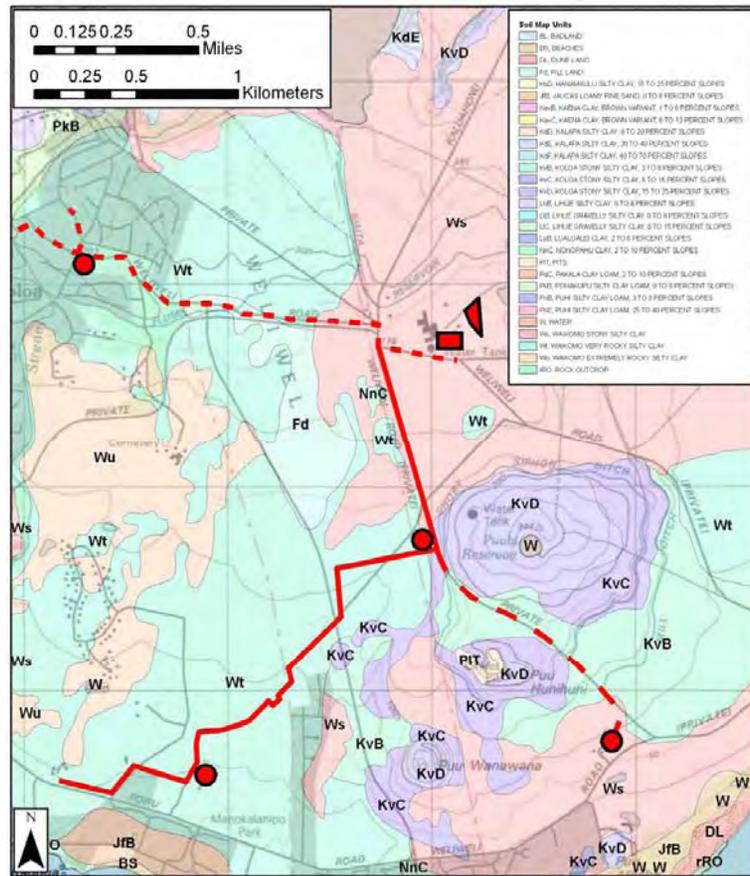


Figure 3. Overlay of Soil Survey of the State of Hawai'i (Foote et al. 1972), indicating sediment types within the project area (indicated in red)

dredging, excavation from adjacent uplands, garbage, and bagasse and slurry from sugar mills” (Foote et al. 1972).

1.4.2 Built Environment

Currently the proposed locations of the Regional WRF and wastewater pump station are all located either within undeveloped parcels, overgrown with exotic vegetation, or within agricultural fields formerly utilized for sugar cultivation. Additionally the proposed gravity lines and force mains run within existing asphalt paved roadways, cane haul roads, and/or railroad grade.

During the post-contact period a majority of the project area had been impacted by land modifications (grubbing, grading, etc.) associated with historic sugar cultivation. An orthophotograph of the area shows the outlines of fallow cane fields as well as former cane fields that are currently being utilized for diversified agriculture, within and in the vicinity of the project area (Figure 4).

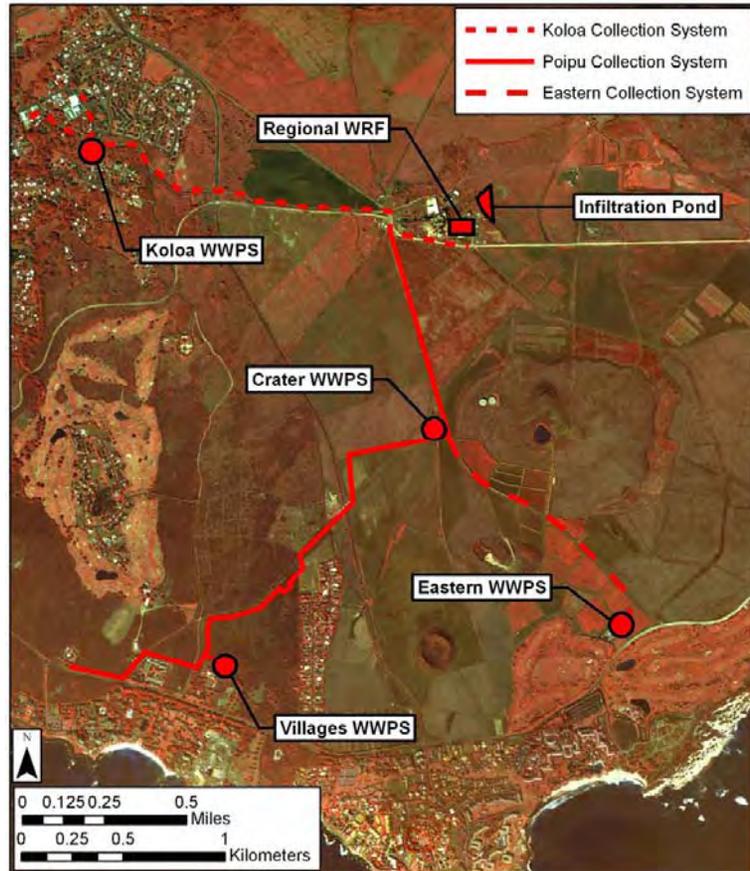


Figure 4. Orthophotograph showing historic and modern land disturbance within and in the vicinity of the project area (source: USDA Aerial Photograph Field Office 2000)

Section 2 Methods

2.1 Field Methods

Missy Kamai, B.A., and Gerald Ida, B.A., conducted the fieldwork effort, which required 10 person-days to complete. Fieldwork took place between January 12th and 16th 2009 under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator).

The fieldwork component of the archaeological inventory survey was carried out under archaeological permit number 07-19 issued 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.

Fieldwork consisted of a 100% coverage pedestrian inspection of the project area. The pedestrian inspection of the study area was accomplished through systematic sweeps. The interval between the archaeologists was generally 5-10 m. All historic properties encountered were recorded and documented with a written field description, scale drawings, photographs, and located using Trimble Pro XR GPS survey technology (accuracy +/- 1 m).

2.2 Document Review

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources (DLNR); a review of geology and cultural history 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 a study of historic maps at the Survey Office of the DLNR. Information on LCAs was accessed through Waihona 'Āina Corporation's Māhele Data Base (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 type and location of sub-surface pre and post-contact historic properties in the project area.

Section 3 Background Research

3.1 Traditional and Historical Background

3.1.1 Mythological and Traditional Accounts

The project area is situated within the Kona District on the island of Kaua'i. Few records exist that document traditional Hawaiian life in the *ahupua'a* of Kōloa. While settlement by westerners with religious and commercial interests made the area a focus of documentation after the first quarter of the 19th century, the accounts generally emphasized the lives and concerns of the westerners themselves, with only anecdotal references to the Hawaiian population. Two 19th century documents, the Boundary Commission Testimony of 1874 and a Lahainaluna manuscript of 1885, however, provide an insight into the history of Kōloa before the arrival of westerners.

A dispute over the northern boundary of Kōloa Ahupua'a in 1874 led to a hearing before Duncan McBryde, the Commissioner of Boundaries for Kaua'i. One native witness, Nao (who described himself as born in Kōloa but presently living in Ha'ikā), in order to show that Hoaea (the area in dispute) was indeed at the northern boundary of Kōloa, testified: "At Hoaea, tea [*sic*] leaves were hung up to show that there were battles going on" (Boundary Commission, Kaua'i, vol. 1, 1874:124). That there were traditional "warning systems"; well-known to all natives; suggests that Kōloa may well have been the scene of some serious conflicts. Throughout the early settlement history of Kōloa, conflicts must have occurred at intervals serious enough and often enough to warrant having to devise such a system.

Additional evidence of a rich history within Kōloa was offered in a Lahainaluna document produced eleven years later. This document appeared to have been based on an oral history project. On September 7, 1885 a student from Lahainaluna Schools (HMS 43 #17) interviewed Makea – "a native who is well acquainted with Kōloa" -- and recorded "what she said about the well-known places in the olden times." More than sixty-four years after the abolition of the *kapu* (taboo) system and almost as many years after contact with westerners, Makea was able to describe fourteen *heiau* (religious structures) within the Kōloa area.

There were several place names within Kōloa that have legendary associations. The name Kōloa itself has several derivations. Kōloa is the name for the large, soft Hawaiian sugar cane (*Saccharum officinarum*) once grown by the Hawaiians; Kōloa is also the name of a steep rock on the banks of Waikomo Stream, from whence the *ahupua'a* got its name. This bank of the river was called Kōloa, after the native Hawaiian duck (*Anas wyvilliana*) (Kikuchi 1963:46; Pukui et al. 1974:116).

Maulili ([meaning] constant jealousy) is a deep pool in Waikomo Stream in the uplands of Kōloa. When the gods Kāne and Kanaloa first came to Kaua'i, legends say they explored the island and came to the pool at Maulili at evening. They stretched out beside the pool for their night's sleep on its eastern bank and left the impression of their forms within the rock: as can be seen in the *'āpapa* (a flat area). The Maulili heiau was first built by Ka-pueo-maka-walu, the son of Kapu-lau-kī. It was a place of human sacrifice (Wichman 1998:12).

This *heiau* may be the Maulili Heiau described by Makea in the Lahainaluna document mentioned above. "The 'āpapa in this vicinity is called an 'Unu.' and a 'Heiau,' but was never walled in, it is said. On the nights of Kāne, the drums are heard to beat there, also at the sacred rocks, or unu's, of Opuokahaku and Kanemilohae, near the beach of Poipu" (Farley 1907).

Bernice Judd, writing in 1935, summarized most of what was known of the traditional Hawaiian life of Kōloa:

In the old days two large *'auwai* or ditches left the southern end of the Maulili pool to supply the taro patches to the east and west. On the *kuānas* [embankments] the natives grew bananas and sugar cane for convenience in irrigating. Along the coast they had fish ponds and salt pans, ruins of which are still to be seen. Their dry land farming was done on the *kula* (dry land), where they raised sweet potatoes, of which both the tubers and the leaves were good to eat. The Hawaiians planted *pia* (arrowroot) as well as *wauke* (paper mulberry) in patches in the hills wherever they would grow naturally with but little cultivation. In the uplands they also gathered the leaves of the *hala* (screwpine) for mats and the nuts of the *kukui* (candlenut) for light (Judd 1935:53).

Beginning possibly as early as 1450, the 'Kōloa Field System' was planned and built on the shallow lava soils to the east and west of Waikomo Stream. The Kōloa Field System is characterized as a network of fields of both irrigated and dryland crops, built mainly upon one stream system. Waikomo Stream was adapted into an inverted tree model with smaller branches leading off larger branches. The associated dispersed housing and field shelters were located among the fields, particularly at junctions of the irrigation ditches (*'auwai*). In this way, the whole of the field system was contained within the entire *makai* (seaward) portion of the *ahupua'a* of Kōloa, stretching east and west to the *ahupua'a* boundaries.

The field system, with associated clusters of permanent extended family habitations, was in place by the middle of the 16th century and was certainly expanded and intensified continuously from that time. Long *'auwai* were constructed along the tops of topographic high points formed by northeast to southwest oriented Kōloa lava flows, and extended all the way to the sea. Habitation sites, including small house platforms, enclosures and L-shaped shelters were built in rocky bluff areas which occupied high points in the landscape and were therefore close to *'auwai*, which typically ran along the side of these bluffs (Hammatt et al. 2004). From A.D. 1650-1795, the Hawaiian Islands were typified by the development of large communal residences, religious structures and an intensification of agriculture. Large *heiau* in Kōloa may date to this period.

The manufacture of salt was important for the Native Hawaiians. Many of the larger salt pans on Kaua'i are located near Nōmīlu, "where people came in the summer to gather salt when the winds blow the salt across the surface of the pond at the edge of the pond where it was carefully scooped out with the hands or with pieces of gourd shell and dried" (Wichman 1998:35). The importance of salt manufacture in the area was illustrated in the 1874 Boundary Commission determination of Kōloa, where the oral testimony of Pene Kalauau claimed he had come all the way "from Koolau to go to Koloa for salt" (Boundary Commission, 1874, Kauai, Vol. No. 1:124).

3.1.2 Early Historic Period

By the early 1800's, Kōloa Landing had become the principal port of Kaua'i. Shipments of North American furs and pelts to the Orient depended on the provisioning of ships at Kōloa Landing, as well as other Hawaiian ports. As the fur trade grew, markets in China became aware of sandalwood (*Santalum sp.*) grown in the Hawaiian Islands. The shipment of most of Kaua'i's sandalwood to the Orient took place at Kōloa Landing, until the supply of the fragrant wood was exhausted around 1830.

Accounts by visitors and settlers at Kōloa focused on the early westerners' own concerns--religious and commercial--as these concerns appeared within the historical record of Kōloa in the 1800's. However, scattered throughout the accounts are occasional references to the Hawaiians of Kōloa that may give some insights into their lives.

The American Board of Commissioners for Foreign Missions (ABCFM) missionary Samuel Whitney described, in an article in the *Missionary Herald* (June 1827:12), a visit to Kōloa with Kaikio'ewa, the governor of Kaua'i, in 1826:

The people of this place were collected in front of the house where the old chief lodged in order to hear his instructions. After a ceremony of shaking hands with men, women, and children they retired...

Our company consisted of more than a hundred persons of all ranks. The wife of the chief, with her train of female attendants, went before. The governor, seated on a large white mule with a Spaniard to lead him, and myself by his side, followed next. A large company of *aipupu*, [*'ā'īpu'upu'u*] cooks, attendants came on in the rear.

Whitney's account suggests something of the deference paid to the *ali'i* (chiefs) by the local populations and the scale at which the *ali'i* carried out their functions. An even grander view of that deference was provided in an account of a later visit by an *ali'i* to Kōloa. John Townsend, a naturalist staying in Kōloa in 1834, described a visit by Kamehameha III (In Palama and Stauder 1973:18):

In the afternoon, the natives from all parts of the island began to flock to the king's temporary residence. The petty chiefs, and head men of the villages, were mounted upon all sorts of horses from the high-headed and high-mettled California steed, to the shaggy and diminutive poney [sic] raised on their natives hills; men, women, and children were running on foot, laden with pigs, calabashes of *Poe* [sic], and every production of the soil; and though last certainly not least, in the evening there came the troops of the island, with fife and drum, and 'tinkling cymbal' to form a body guard for his majesty, the king. Little houses were put up all around the vicinity, and thatched in an incredibly short space of time, and when Mr. Nuttall, and myself visited the royal mansion, after nightfall, we found the whole neighborhood metamorphosed; a beautiful little village had sprung up as by magic, and the retired studio of the naturalists had been transformed into a royal banquet hall.

In 1835, Thomas Nuttall and John K. Townsend, two American naturalists, visited the Kōloa area. They noted "fields of taro, yam, and maize (possibly sugar cane), irrigation networks and sweet potato patches in the dryer areas" (Townsend 1839:206).

On December 31, 1834, Peter Gulick and his family arrived in Kōloa. Apparently the first foreigners to settle in the *ahupua'a*, they initiated the process of rapid change that would reshape the life of Kōloa in the nineteenth century. In 1835, a 30 by 60 foot grass house was erected as a meeting-house and school near the Maulili Pond. Mr. Gulick cultivated sugar cane and collected a cattle herd for the Protestant Mission. In 1837, a 45 by 90-foot adobe church was built where Kōloa Church stands today, and the first mission doctor, Thomas Lafon, arrived to assist Mr. Gulick (Damon 1931:179, 187). The Kōloa mission station apparently flourished immediately. Navy Lieutenant Charles Wilkes, a member of the U.S. Exploring Expedition, during his visit to Kōloa in 1840 recorded:

The population in 1840, was one thousand three hundred and forty-eight. There is a church with one hundred and twenty-six members, but no schools. The teachers set apart for this service were employed by the chiefs, who frequently make use of them to keep their accounts, gather in their taxes &c. The population is here again increasing partly by immigration, whence it was difficult to ascertain its ratio (Wilkes 1845:64).

Kōloa Village and Kōloa Landing, at the mouth of the Waikomo Stream, became flourishing commercial centers as trade with Americans and Europeans grew. An estimate in 1857 stated that "10,000 barrels of sweet potatoes were grown each year at Kōloa, and that the crop furnished nearly all the potatoes sent to California from Hawai'i" (Judd 1935:326). Sugar and molasses were also chief articles of export. Whalers used the Kōloa "Roadstead" from 1830 to 1870, and took on provisions of squashes (pumpkins), salt beef, pigs, and cattle (Damon 1931:176). Hawaiians grew the pumpkins on the rocky land north of the landing. There were also numerous salt pans along the shore near the landing that were used to make the salt (Palama and Stauder 1973:20).

3.1.3 Mid-1800s and the Great Māhele

In the early Post-Contact period, the *ahupua'a* of Kōloa was controlled by the ruling chief of Kaua'i and was administered by lesser chiefs appointed by him. When Ka-umu-ali-i, last of the ruling chiefs of the island, died in 1824, his lands (Kaua'i and Ni'ihau) were given to the lineal descendants of Kamehameha. Queen Ka'ahumanu redistributed the lands among chiefs of other islands who had been loyal to the bloodline of Kamehameha. By the mid-19th century, control of the *ahupua'a* of Kōloa was divided between Kamehameha III and Moses Kekūāiwa, a brother of Kamehameha IV (Alexander 1937). The Māhele Award records indicate that Kōloa Ahupua'a, which totaled 8,620 acres, was granted by way of a Land Commission Award (LCA) to Moses Kekūāiwa, (the brother of Alexander Liholiho [Kamehameha IV]), Lot Kapūāiwa (Kamehameha V), and Victoria Kamāmalu (LCA 7714-B: Waihona 'Aina 2000).

Eighty-nine *kuleana* awards were given to individuals within Kōloa Ahupua'a. The majority of these Land Commission Awards (LCAs) were located in and around Kōloa Town itself. No LCAs were granted within the present project area; however an 1891 map of Kōloa by M.D. Monsarrat indicates two LCAs (LCA 3606 and 10272) in the vicinity of the southwest portion of

the project area (Figure 5 & Table 1), and three LCAs (LCA 6667, 6309, and 3584) in the vicinity of the northwest portion of the project area (Figure 6 & Table 2).

LCA 3606 transferred a section of the *'ili* of Pu'u-ohaku to the claimant "Kamae" using the traditional "metes and bounds" description in use at the time. Distance was measured in "chains". An amount of "kula" land, twelve taro patches, two potato patches, a house lot, and a cattle yard were claimed as appurtenant to LCA 3606. There was a reference within this LCA to the planting of "sugar cane and yams" before 1848 (No. 3606, Kamae, Koloa, Kauai, January 12, 1848, Native Register 71v9/ Foreign Testimony 30-31v13/ Native Testimony 35v13, Royal Patent 7269).

LCA 10272 transferred a section of the *'ili* of Ma'ulili to the claimant "Makalulu" using traditional boundary descriptions. An amount of "kula" land, a house lot, one taro patch, and four dry taro patches were claimed as appurtenant to LCA 10272 (No. 10272, Makalulu, Koloa, Kauai, January 7, 1848, Native Register 272v9/ Foreign Testimony 24v13/ Native testimony 27v13, Royal Patent 8367, Registration Map 1694 Monsarrat).

Testimonies provided to the Land Commission by applicants of LCAs 3584, 6309 and 6667 were generally limited to stating the boundaries of their claimed lands as well as land use. All three LCAs are indicated as being enclosed by stone walls and note the presence of additional house lots and *lo'i* of other claimants in the vicinity. Of particular interest are the stated boundaries of LCA 6309, which indicated the presence of pasture lands immediately *puna* (east) of the LCA. This may explain the presence of numerous stone walls described in the land claims and shown on the 1891 Monsarrat map, a portion of which is shown running through the the project area (see Figure 6). These walls are likely cattle barriers used to keep cattle out of house lots and agricultural plots.

A review of Mahele documents (LCAs) indicates that in the vicinity of the southwest and northwest portions of the project area, land usage and activity by the mid-nineteenth century included habitation, cattle ranching, and agriculture, including the cultivation of taro, sugar, potatoes, and yams. This may reflect the continuation into that century of traditional Hawaiian land use within the project area.

The 1891 Monsarrat map also indicates taro and associated walls located in the vicinity of the southwest portion of the project area, and numerous walls, fences, and structures in the vicinity of the northwest portion of the project area (see Figure 5 & Figure 6) This suggests that taro cultivation may have occurred within the southern portion of the project area, and the habitation, agriculture, and ranching may have occurred within the northwestern portion of the project area.

The Koloa Sugar Company began commercial operation in the late 1840's with about 450 acres of Kolōa land under cultivation. Development of additional acreage continued gradually. A 1935 map of Koloa Sugar Company shows the extent of cane lands within the project area (Figure 7).

In 1882, the Koloa Sugar Company announced it had ordered all the components for a plantation railroad. According to the *Planter's Monthly*, Volume 1 of 1882, "It (the railroad) will consist of four miles of 30 inch gauge track, forty cars 5 x 10 feet, and one locomotive..." (Conde 1993: 28). According to Arthur C. Alexander, in *Koloa Plantation 1835-1935*, "Cut cane

Figure 5. Portion of 1891 Map of Kōloa by M.D. Monsarrat (R.M.1694), showing the location of the southwest portion of the project area (indicated in red) and Land Commission Awards (LCAs) in the vicinity

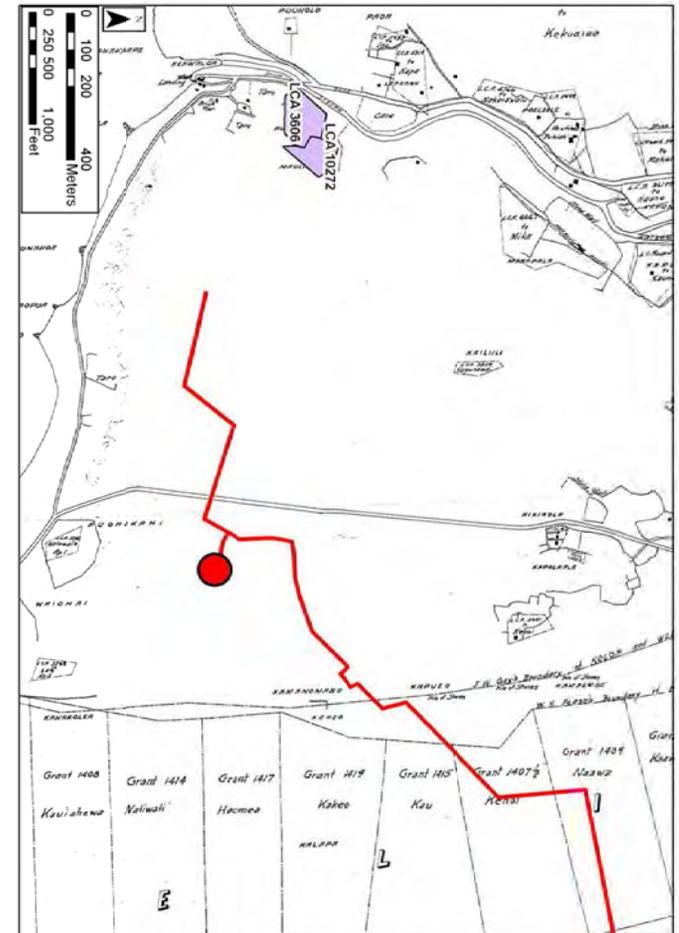


Table 1. Land Commission Awards in the vicinity of the southwest portion of the project area

LCA	Awardee	ʻIli	Land Use
3606	Kamae	Pu'u-ohaku	<i>Kula</i> land, twelve taro patches, two potato patches, a house lot, and a cattle yard
10272	Makalulu	Ma'ulili	<i>Lo'i</i> , <i>kula</i> , house lot, and four dry taro patches

Figure 6. Portion of 1891 Map of Kōloa by M.D. Monsarrat (R.M.1694), showing the location of the northwest portion of the project area (indicated in red) and Land Commission Awards (LCAs) in the vicinity

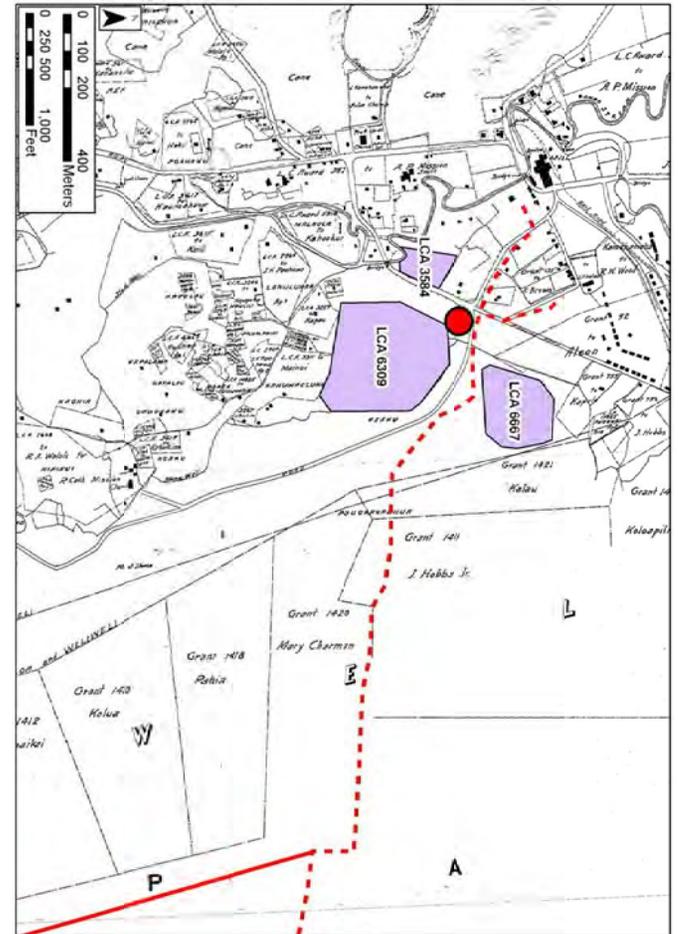


Table 2. Land Commission Awards in the vicinity of the northwest portion of the project area

LCA	Awardee	ʻIli	Land Use
3584	Kaanaana	Maʻulili	House lot
6309	Kapuniaia, Elia	Hakeku	House lot
6667	Kailihakuma, Mika	Wailua	Loʻi & sugarcane

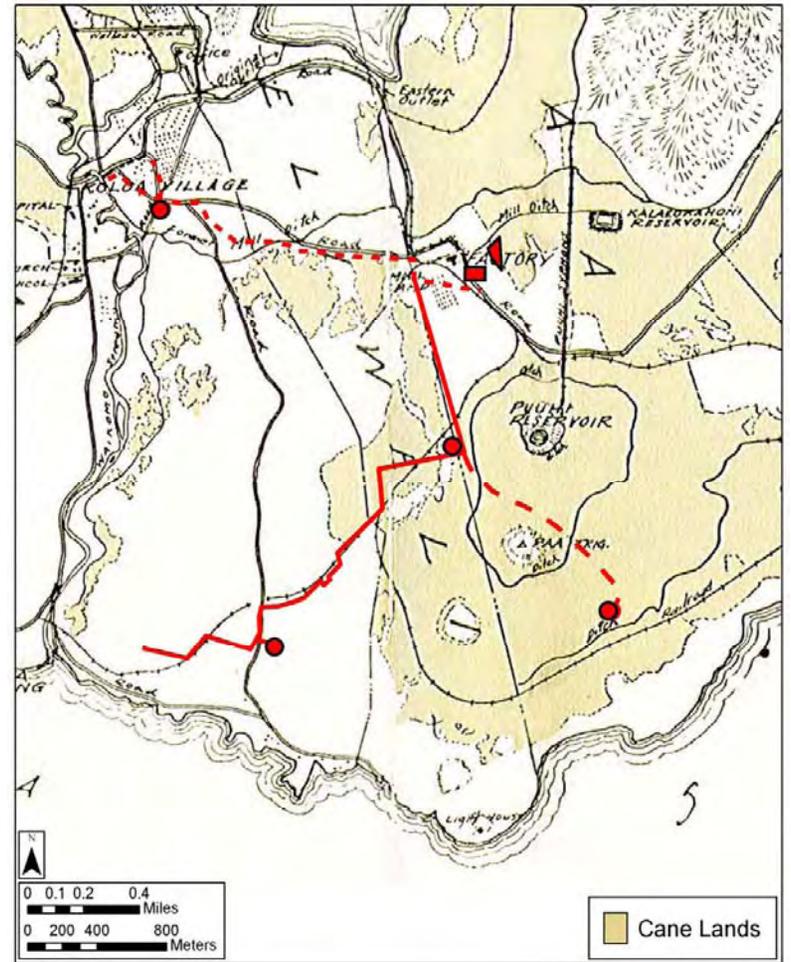


Figure 7. Portion of 1935 Koloa Sugar Company map showing the extent of cane lands within the project area

was hauled to the mill by oxcart until 1882. In that year, 3½ miles of 30-inch gauge, 18 pound railroad track and 50 cars were purchased”(Conde 1993: 28).

By 1885, the railway extended to Kōloa Landing where steamers transported the bags of sugar to the mainland (Figure 8). A motorized derrick winched the bagged sugar from the railroad cars to the warehouse on the west side of the landing. From there, bagged sugar was loaded onto small lighters, which would row the sugar out to waiting ships in the harbor. By 1895, the railroad had extended a spur line through the coastal lands of Kōloa into Weliweli to aid in the harvest around Pā`ā. Remnants of this spur line are seen today throughout lower Po`ipū, and include the stacked basalt railroad berm located in the vicinity of the southwestern portion of the present project area.

3.1.4 1900s

The Koloa Sugar Company had previously purchased the *ahupua`a* of Pā`ā southeast of Kōloa town, and a large parcel of it was unproductive. A new and much larger mill was built there in 1912 about a mile from Kōloa (Figure 9). New railroad track was laid, and an asphalt road was built to connect the new mill with Kōloa Landing. World War I caused a huge demand for sugar. By the end of hostilities in 1918, the Koloa Sugar Company was producing 9,000 tons of sugar each year, and adding additional acreage.

Kōloa Landing was phased out around 1925 when McBryde Sugar Company and the Koloa Sugar Company began shipping their product out of Port Allen Harbor at Hanapepē. The McBryde Plantation had been improving the facilities at Ele`ele Landing since the turn of the century, and a private company, the Kauai Terminal Limited Railway, had developed a modern bridge crossing the Hanapepē River. Soon after this, the Koloa Sugar Company ceased to use the *makai* (seaward) Kōloa fields, and much of the area was converted into cattle-grazing pasture by the Knudsen family. Most of the *mauka* (upland) areas of Kōloa remained under sugar cane cultivation as late as the 1970s, when these cane lands were converted into pasture.

Following the merger of the plantation lands of the Koloa Sugar Company and Grove Farm Company in 1948, the combined lands under cultivation required new sources of irrigation water. In 1965, Grove Farm built a tunnel to bring the waters from Ku`ia directly into the Waitā (Kōloa) Reservoir. Grove Farm leased these cane lands to McBryde Sugar Company when it terminated sugar operations in 1974 (Wilcox 1996). The mill in Pā`ā was finally closed in 1996, and remains a landmark of the countryside.

The Tax Map of Section (4) 2-8 made in 1936 (Figure 10) shows a dotted area enclosing a portion of the southwestern project area. This area is labeled “House Sites, Fireplaces; Lava Tubes; Enclosures, and Taro Patches in This Area.” This map also shows a pond just south (*makai*) of the current project area, with the words “Fish Pond and Taro Patch.” A second pond is located southeast of the current project area and labeled “Pa`u a Laka, Salt Ponds.”

3.1.5 Modern Land Use

By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline. Although the town had established a Civic Center in 1977, the pace of tourism-driven development at the shoreline had been drawing construction and service jobs away from the town center. The Kīahuna Plantation Resort opened in 1967, followed by the construction of

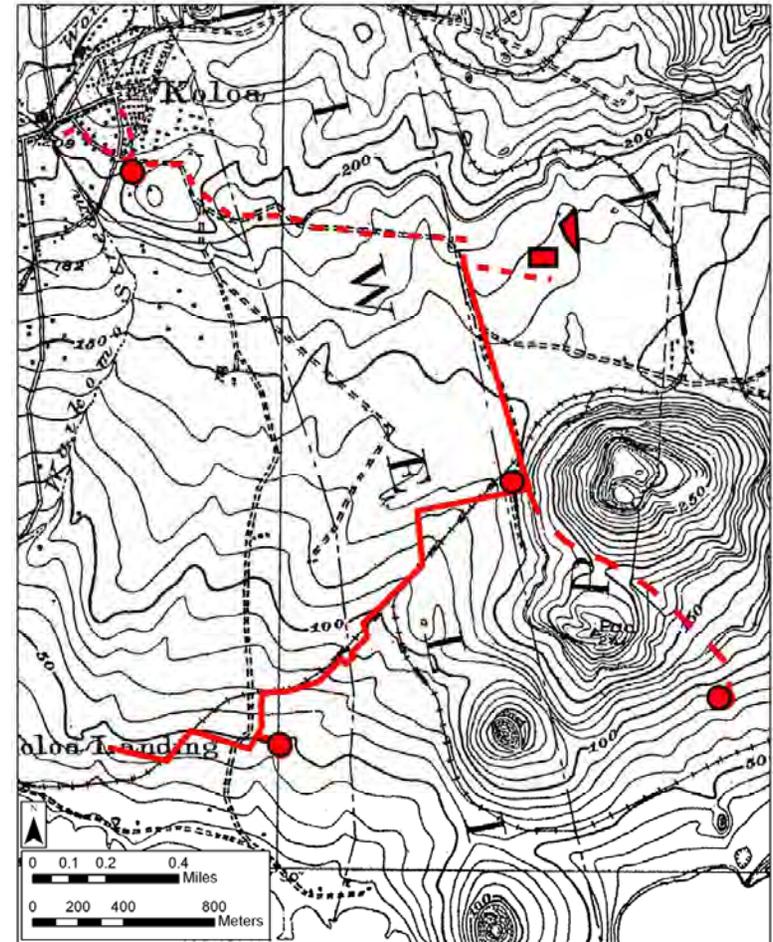


Figure 8. 1910 USGS topographic map, Lihue Quadrangle, showing the network of railroad tracks within the Kōloa District. Note that a majority of the project area (indicated in red) is situated within either railroad right-of-ways or cane haul roads.

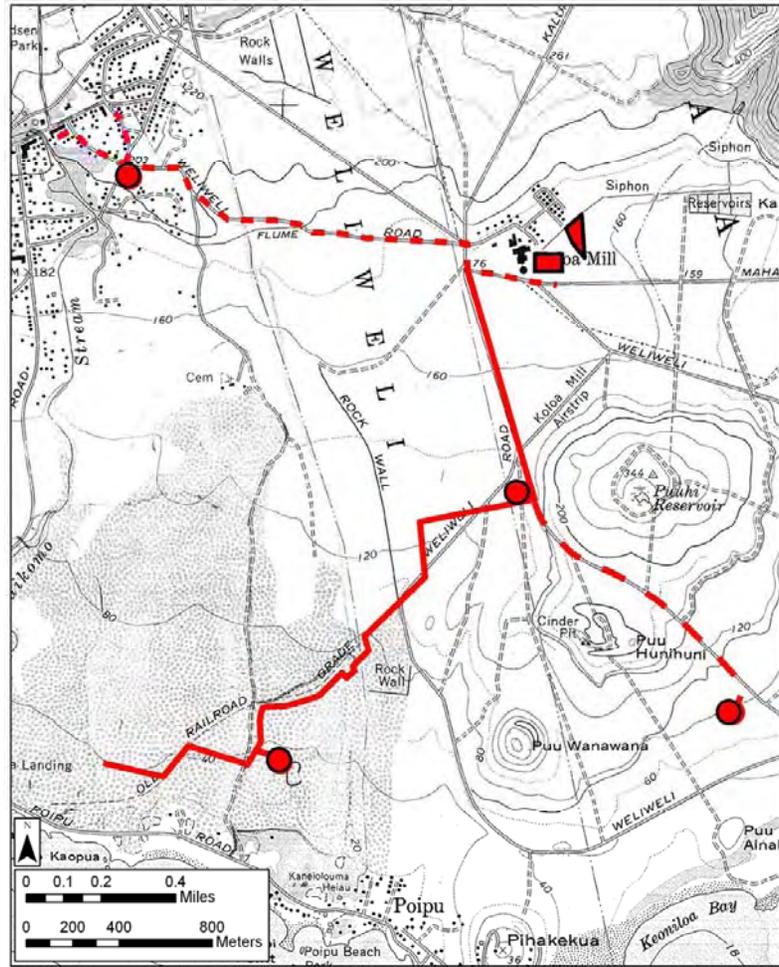


Figure 9. 1963 USGS topographic map, Kōloa Quadrangle, showing the location of newly constructed (circa 1912) sugar mill in relation to the project area

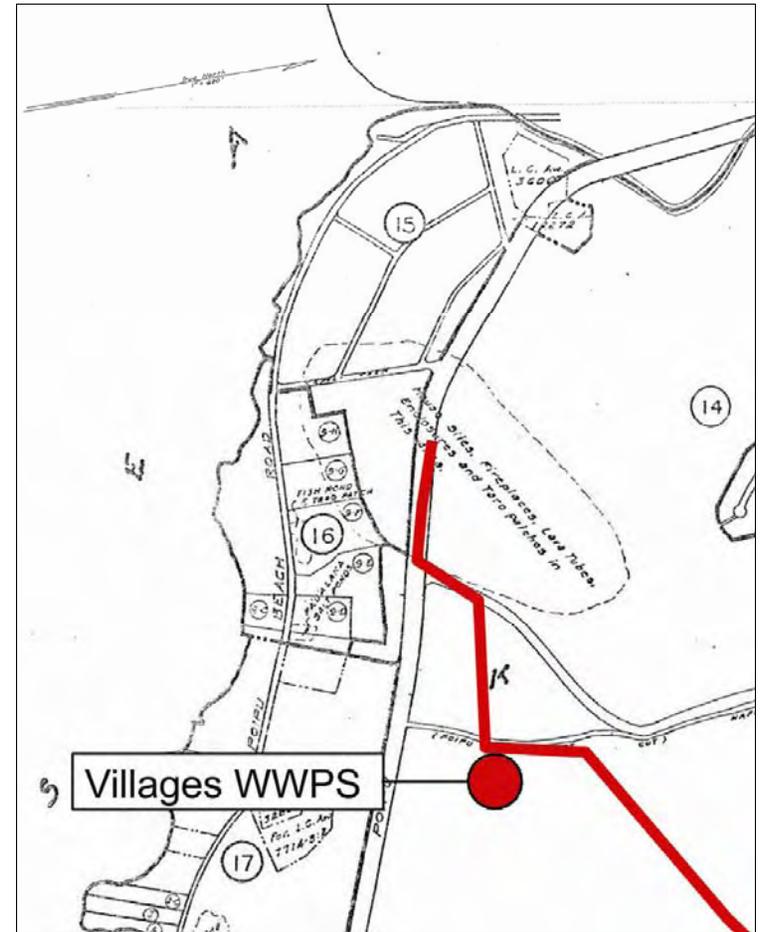


Figure 10. Portion of Tax Map Key (4) 2-8, (c. 1935) Note annotations “Fishpond and Taro Patch” just south of project area (indicated in red) and “House Sites, Fireplaces; Lava Tubes; Enclosures and Taro Patches in this Area” enclosing a portion of the southwest section of the project area.

various condominiums throughout the 70's and 80's. Finally, the Hyatt Regency Resort, with its expansive golf course, opened in 1991.

By the early 1990's, the tourist industry had successfully attached the name "Po'ipū Beach" to the entire coastline beginning at Kōloa Landing, and continuing east to Makahū'ena Ledge. With the development of the Po'ipū Bay Resort Golf Course and the Hyatt Regency Kaua'i Resort Hotel, the Po'ipū Beach name became synonymous with all two miles of coastline fronting the Wai'ohai, Kiahuna, and Sheraton developments; ending at Po'ipū Beach Park (Donohugh 2001).

Future plans within the Kōloa District will place more demands on beachfront properties along the coastline. Over 1,000 acres of former sugar plantation lands are slated for hotel and condominium development surrounding both Lāwa'i and Po'ipū coastal resort areas (Donohugh 2001). Future development plans for the upland areas involve both large tracts of lands, as well as regional redevelopment within Kōloa Town itself.

3.2 Previous Archaeological Research

3.2.1 Initial Archaeological Studies at Kōloa

Evidence of the importance of Kōloa to pre-contact traditional Hawaiians was indicated in a Lahainaluna Schools document produced in 1885. This document appeared to have been based on an oral history project utilizing information obtained from Makea – "a native who is well acquainted with Kōloa". Makea was able to describe fourteen *heiau* (religious structures) within the Kōloa area. Of the 14 *heiau* five (5) were associated with human and animal blood sacrifices (*luakini* and *po'okanaka*), five (5) with fishing, two (2) medicinal, and one (1) agricultural, with one (1) of unknown function (Lahainaluna 1885 HMS 43 #17).

Thomas Thrum was the next to document sites in the Kōloa area in his list of the *heiau* of Kaua'i (Thrum 1907). He discussed six *heiau* in the district of Kōloa, which once extended from Hanapēpē to Māhā'ulepū (Table 3). The *heiau* were Hanakalauae (Kōloa Ahupua'a), Kanehaule (inland Kōloa Ahupua'a), Kihouna (Kōloa Ahupua'a), Kaneiolouma (Kōloa Ahupua'a), Weliweli (Weliweli Ahupua'a), and Waiopili (Māhā'ulepū Ahupua'a).

3.2.2 Archaeological Investigations in the Vicinity of the Project Area

The following is a discussion of previous archaeological investigations conducted in the vicinity of the project area (Figure 11 & Table 4). A majority of the investigations have been conducted within the *ahupua'a* of Kōloa in conjunction with the burgeoning development of the area. In contrast the archaeological record in the *ahupua'a* of Weliweli and Pa'a is relatively sparse, due to the fact that these *ahupua'a* are relatively undeveloped and have been continuously under cultivation (historic sugar followed by modern diversified agriculture) for over a century.

The earliest systematic archaeological survey on the Island of Kaua'i was conducted by Wendell Bennett in the late 1920s. Bennett examined and recorded 202 sites on the island. According to his site location map (Figure 12; Bennett 1931:98), Sites 76, 83, 85, and 86 appear to be in the vicinity of the project area.

Table 3. Kōloa *heiau* documented by Thrum in 1907

Name	Location	Remarks
Hanakalauae	Mahaulepu, Koloa	Of large size, destroyed years ago by Fredenberg to erect cattle pens with its stones.
Kanehaule	Kaunuieie, Koloa	A paved walled enclosure of large size, destroyed some time ago: a <i>heiau</i> where rites of circumcision were performed.
Kihouna	Poipu, Koloa	A single walled <i>heiau</i> situate a short distance west of the above, 100x125 feet, enclosed on all sides by walls 4 to 6 feet high, with entry way near middle of mauka wall: seaward or makai wall 8 feet thick. A section of stones as of pavement shows nearly the whole length near makai wall and in N.E. corner is a section said to have been its altar stones.
Kaneiolouma	Poipu, Koloa	Size 102x180 feet, lying nearly east and west along shore close to the beach; of three terraces, with two prominent and other room divisions at east or inner end: west end open; side walls 3 to 5 feet high; seaward wall 9 feet thick; east end wall very crooked, 11 feet thick, 6 feet high. Inner terrace is stone paved, middle terrace partly so, with flat slabs of coral or limestone.
Weliweli	Weliweli, Koloa	A paved <i>heiau</i> of large size. Pookanaka class; walls 4 feet high: portions of same said to be still standing.
Waiopili	Mahaulepu, Koloa	An oblong <i>heiau</i> of good size, walls still standing.

Table 4. Previous Archaeological Investigations in the Vicinity of the Project Area

Reference	Type of Investigation	Findings
Bennett 1931	Archaeological Survey	Identified Site's 76 (salt pans), 83 (Weliweli Heiau), 85 (concentration of walls and enclosures), and 86 (large pre-contact house site) in the vicinity of the project area.
Palama & Stauder 1973	Archaeological Reconnaissance	18 historic properties (SIHP #50-30-10-3173 to -3190) identified consisting of pre-contact habitation structures (dwelling caves, miscellaneous enclosures, and a platform) livestock enclosures, an agricultural complex ('auwai network) and a burial platform. No historic properties were observed in the vicinity of the current project area.
Hammatt et al. 1978	Archaeological Survey	15 historic properties identified in the immediate vicinity of the current project area, consisting of pre-contact and early post-contact Hawaiian habitation and agricultural features: stacked stone enclosures (SIHP - 3455, -3457, & -3820), platforms (SIHP - 3463, -3757, & -3758), c-shapes (-3694, -3695, -3705, & -3756); an 'auwai network (SIHP -3823).
Kikuchi 1981	Archaeological Reconnaissance	Pre- and post-contact archaeological sites observed within the study area. Pre-contact archaeological sites consisted of 'auwai remnants, terraces, and enclosures; Post contact sites consisted of a well, rock walls, a railroad causeway, and other various rock structures.
Walker & Rosendhal 1990	Archaeological Inventory Survey	18 historic properties identified consisting of pre-contact and early post-contact habitation, boundary, and ceremonial features in the form of C-shapes, walls, platforms, terraces, and mounds. Post-contact sites consisted of agricultural clearing mounds. Human skeletal remains were noted eroding out of sand dunes along the coast.

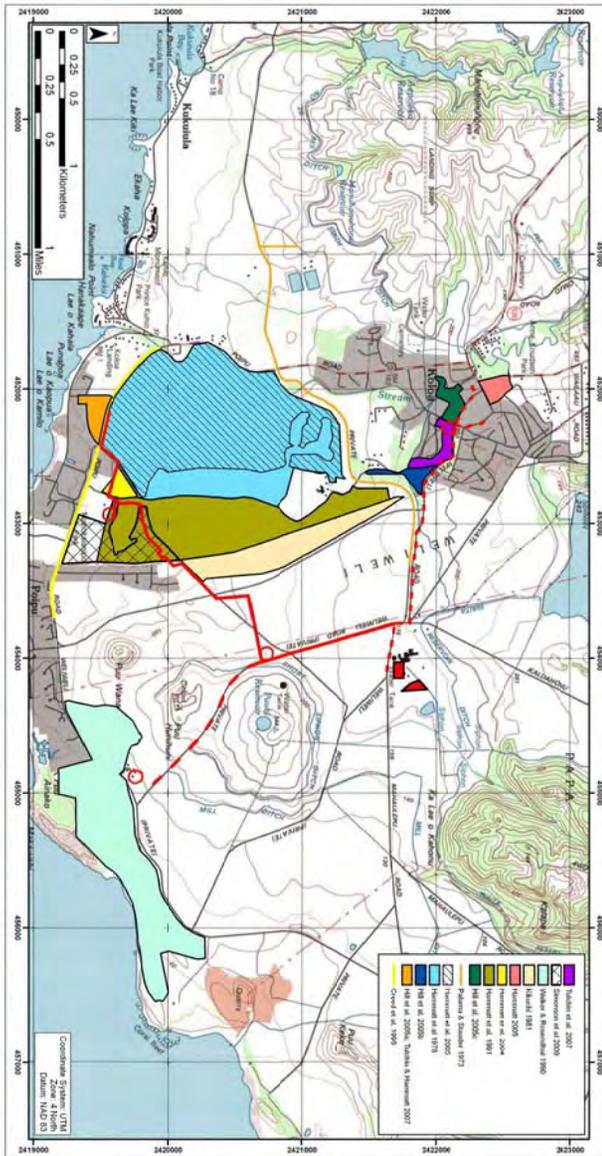


Figure 11. Previous archaeological investigations in the vicinity of the project area (indicated in red)

Archaeological Inventory Survey for the Proposed Kōloa-Po'ipū Regional WRF & Collection System
 TMK: [4] 2-8-004; [4] 2-8-008; [4] 2-8-009; [4] 2-8-011; [4] 2-8-014; [4] 2-8-022; [4] 2-8-001

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Reference	Type of Investigation	Findings
Hammatt et al. 1991	Archaeological Inventory Survey	75 historic properties identified including both pre- and post-contact sites. Pre-contact historic properties consisted of habitations (platforms and enclosures), agricultural features (<i>'auwai</i> , field walls, terraces, and earthen mounds) and human burials; Post-contact contact historic properties consisted of a single house platform associated with an LCA and a brick and mortar corral.
Creed et al. 1995	Archaeological Inventory Survey	3 historic properties identified, including two enclosures, a terrace, and a portion of the Kōloa-Weliweli boundary wall.
Hammatt et al. 2004	Archaeological Survey	Eight historic properties identified. Pre- and early post contact habitation structures consisted of platforms (SIHP -3757 & -3758), enclosures (SIHP -3756 & -3758), and a mound (-541); agriculture structures consisted of clearing mounds (SIHP -539 & -540). Two historic properties associated with historic transportation were also identified: SIHP -947, a segment of the Kōloa Sugar Company railroad berm; and SIHP -992, a segment of Hapa Road.
Hammatt et al. 2005	Archaeological Inventory Survey & Data Recovery	Reorganized and reanalyzed data originally collected during the 1978 ARCH study and identified 462 historic properties associated with Kōloa Field system. Documented historic properties included 316 habitation sites (131 temporary and 214 permanent), 102 agricultural sites, 6 storage areas, 1 petroglyph site, 1 historic crypt with no burial, a heiau, and a historic railroad berm. Radiocarbon analysis indicated that primary occupation of the study area occurred between 1400 and 1600 A.D.
Hammatt 2005	Archaeological Inventory Survey	One historic property identified: SIHP #50-30-10-3922, an earthen berm associated with a former plantation road and railroad.

Reference	Type of Investigation	Findings
Hill et al. 2005a	Archaeological Inventory Survey	4 historic properties identified: SIHP -947, segment of railroad berm attributed to the Koloa Sugar Company; SIHP -362, pre-contact temporary habitation stacked basalt enclosure; SIHP -363, pre-contact temporary habitation overhang; and SIHP No. -3920, a railroad-era rock-crushing site.
Hill et al. 2005b	Archaeological Inventory Survey	One historic property identified: SIHP #50-30-10-3926, an elevated metal irrigation flume constructed in 1902.
Hill et al. 2005c	Archaeological Inventory Survey	Six historic properties identified: SIHP -3930, a post-contact boundary wall; SIHP -3931, a pre-contact / post-contact terrace; SIHP -3932, a post-contact irrigation reservoir; SIHP -3933, a post-contact house foundation; SIHP -3934, a post-contact irrigation ditch; and SIHP -3935, a pre-contact / post-contact stacked rock wall.
Hammatt 2005	Archaeological Inventory Survey	One historic property was identified: SIHP #50-30-10-3922, an earthen berm associated with a former plantation road and railroad.
Tulchin et al. 2007	Archaeological Inventory Survey	One historic property identified: SIHP #50-30-10-5002, a post-contact stone wall.
Tulchin & Hammatt 2007	Data Recovery	Radiocarbon analysis of charcoal samples collected from SIHP -362 yielded a date range (1410AD to 1530AD) that is within the pre-contact period, suggesting that the temporary habitation enclosure was constructed and utilized by pre-contact indigenous Hawaiians.
Simonson et al. 2009	Data Recovery	Relocated 39 previously identified historic properties within the study area. Test excavations revealed that a majority of the archaeological features were utilized sporadically as temporary habitations.

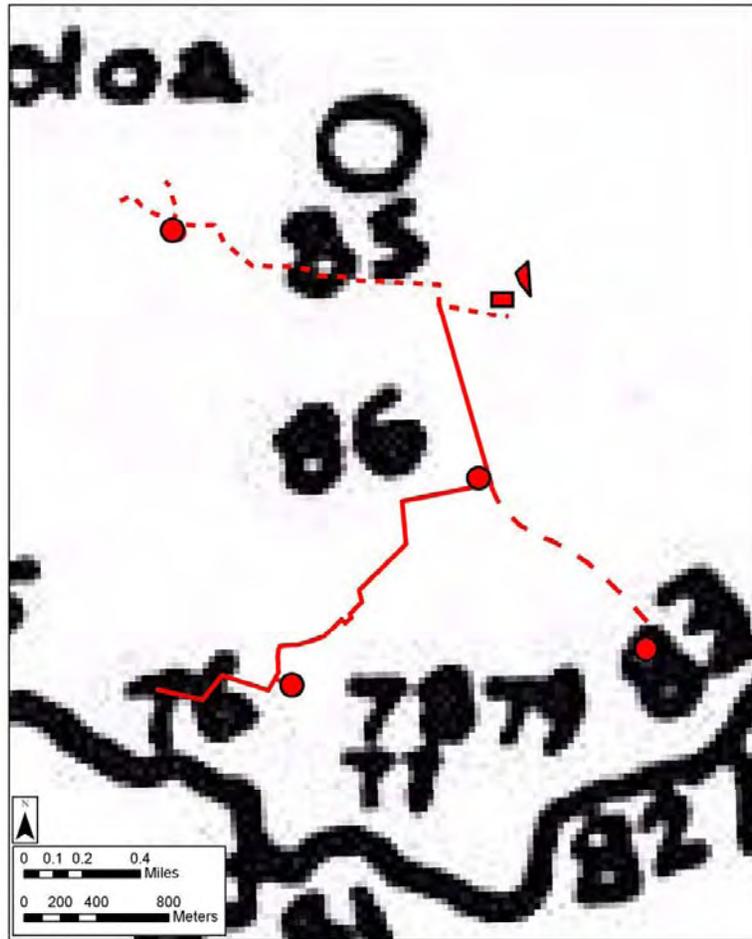


Figure 12. Portion of Bennett's 1931 index map of Kaua'i showing the approximate locations of archaeological sites in the vicinity of the project area (indicated in red) (Adapted from Bennett 1931)

Bennett's Site 76 [later designated State Inventory of Historic Properties (SIHP) #50-30-10-076] is shown on his site map (Bennett 1931: 98) as in the immediate vicinity of the southwestern portion of the project area (see Figure 12). The following is Bennett's description of Site 76:

Site 76. Salt pans, east of Waikomo stream along the shore.

In these numerous salt pans, some divisions are made by a single row of flat stones on edge, others by round stones in line, still others by a double row of stones with dirt or sand filled in between for a sort of a walk.

Site 83 (SIHP #50-30-10-083), Weliweli Heiau, is located in the immediate vicinity of the southeastern tip of the project area (see Figure 12). The following is Bennett's description of Site 83:

Site 83. Weliweli heiau, on the shore of Weliweli section, Koloa.

Described by Thrum as "A paved heiau of large size, pookanaka class; walls 4 feet high; portions of same to be still standing." The cane field has been cleared and the stones piled over this heiau.

Bennett provides the following description of Sites 85 and 86 (SIHP #50-30-10-085 & -086), located in the vicinity of the northern half of the project area (see Figure 12):

Site 85. Innumerable walls, some of them inclosures [sic] and some merely division walls and fences. In one large, walled inclosure [sic], there were three piles of stone near one end. The center one, and the largest, was 10 by 7 feet and 2 feet high. It was built up around the edge with large stones and filled with 2-inch pebbles. On each side of the structure was a 3 by 3 by 2-foot pile of rocks. There are some fine house sites on flat places on the lava flows, slightly leveled with small stones. House sites about 10 by 15 feet are found everywhere on the lava. The walls are of different types of construction and some have been restored for modern use.

Site 86. This special house is rectangular, 25 feet wide, and 45.5 feet long, inclosed [sic] by walls 2 feet wide and about 2 feet high (Figure 13). It is divided into two sections. The south section is paved with small stone and has a terrace across the southern end. East of this section, outside the wall, is a roughly paved irregular area. The roughly paved north section is one foot lower than the south section, the walls being correspondingly higher. Outside the west wall of this house near the center is a paved platform in which is a square depression. The walls of this house site are made of double rows of stones on edge with a small stone fill between them. Coral is found in the walls. Southwest of this house site is another, with walls on three sides only, which measures 15 by 15 feet.

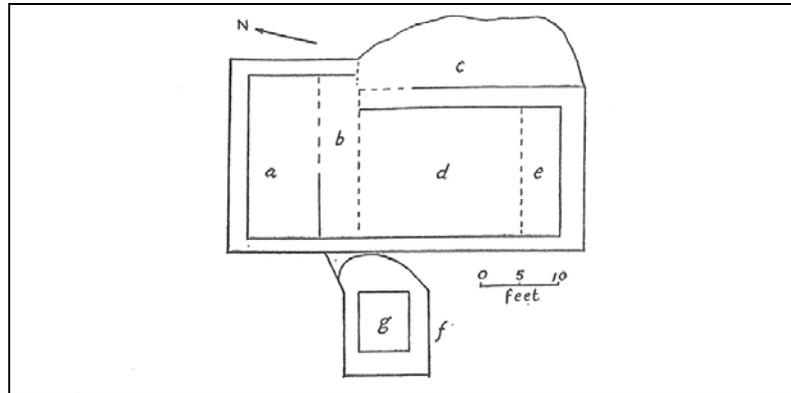


Figure 13. Plan of Koloa house site, Site 86. a, walled area 9 by 25 feet, 1 foot high; b, terrace 5 by 25 feet, 1 foot high; c, roughly paved area; d, section 21 by 30 feet; e, terrace 5 by 21 feet, 6 inches high; f, platform 11 by 11 feet; g, depressions 7 by 7.5 feet, 1 foot deep (Adapted from Bennett 1931:121).

In 1973, Archaeological Research Center of Hawaii (ARCH) conducted an archaeological reconnaissance of a proposed cane haul road to the Koloa Mill (Palama & Stauder 1973). The proposed new section of road extended from Weliweli Road, southwestward across Po'ipū Road, connecting to an existing cane haul road. A total of 18 historic properties (SIHP #50-30-10-3173 to -3190) were identified along the southwestern portion of the study area. All observed historic properties were of pre-contact origin and consisted of habitation structures (dwelling caves, miscellaneous enclosures, and a platform) livestock enclosures, an agricultural complex ('auwai network) and a burial platform. No historic properties were documented in the vicinity of the current project area.

In 1978, ARCH conducted an archaeological survey of 460 acres for the then-proposed Kīahuna Golf Village, located on the east side of Waikomo Stream and Po'ipū Road (Hammatt et al. 1978). A total of 583 archaeological features were identified, including 175 stone enclosures, 108 stone house platforms, 10 habitation caves, a *heiau*, extensive 'auwai networks, ponded fields, terraced plots, and mounded fields. These features suggest intensive pre-contact and early post-contact Hawaiian settlement with a focus on wet and dry land agriculture. Many of the archaeological remains identified were considered unique as they reflected "a complex Hawaiian adaptation of intensive agriculture and settlement to a dry, rocky leeward environment" (Hammatt et al. 1978).

An analysis of site location maps generated during the 1978 ARCH study, indicate 12 historic properties in the immediate vicinity of the current project area (Figure 14). Documented historic properties consist of pre-contact and early post-contact Hawaiian habitation and agricultural structures. Habitation structures consisted of stacked stone enclosures (SIHP -3455, -3457, & -3820), platforms (SIHP -3463, -3757, & -3758), and c-shapes (-3694, -3695, -3705, & -3756); agriculture structures consisted of an 'auwai network (SIHP -3823). SIHP -3756, -3757, & -3758 were recommended for preservation; no further work was recommended for the remaining historic properties identified in the vicinity of the current project area. Modern development of the area has subsequently destroyed SIHP -3455, -3457, -3462, -3820, and -3823.

In 2005, CSH returned to the Kīahuna Golf Village to complete archaeological investigations initially conducted by ARCH in 1978 (Hammatt et al. 2005; Hammatt et al. 1978). The CSH study area consisted of approximately 400 acres, 60 acres less than the original 1978 ARCH study. CSH reorganized and reanalyzed the data originally collected during the 1978 ARCH study and identified 462 historic properties within the truncated Kīahuna Golf Village study area. The 462 historic properties were primarily of pre-contact and/or early post-contact origin and are attributed to being a part of the Kōloa Field system. Documented historic properties included 316 habitation sites (131 temporary and 214 permanent), 102 agricultural sites, 6 storage areas, 1 petroglyph site, 1 historic crypt with no burial, a *heiau*, and a historic railroad berm.

The 2005 CSH investigations of the Kīahuna Golf Village also included data recovery of 31 historic properties. The data recovery effort involved subsurface testing in the form of controlled hand excavations at the selected historic properties. Observed and collected indigenous Hawaiian artifacts consisted of primarily of lithic debitage, volcanic glass flakes, and fishing implements (bone and marine shell fish hooks as well as sinkers or various material), with a smaller occurrence of ornaments (shell, bone, and dog teeth) and a single *ulu maika* (traditional

Hawaiian game stone). Radiocarbon analysis indicated that primary occupation of the study area occurred between 1400 and 1600 A.D.

In 1981, the Anthropology Club of Kaua'i Community College conducted an archaeological reconnaissance survey of the Weliweli Track which was proposed for the development of residential housing (Kikuchi 1981). Extensive bulldozing of historic origin was noted within the study area. Even with the land disturbances, both pre- and post-contact archaeological sites were observed within the study area. Pre-contact archaeological sites consisted of 'auwai remnants, terraces, and enclosures; Post contact sites consisted of a well, rock walls, a railroad causeway, and other various rock structures. No SIHP numbers were assigned to the archaeological sites observed within the study area.

In 1990, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological inventory survey for the proposed Hyatt Regency Golf Course located within coastal Pa'a Ahupua'a (Walker & Rosendahl 1990). 18 historic properties were identified within the seaward portion of the study area. It is believed that historic properties that were likely present within the inland portion of the study area but were destroyed during land disturbances associated with sugar cultivation. Observed historic properties consisted of pre-contact and early post-contact habitation, boundary, and ceremonial features in the form of C-shapes, walls, platforms, terraces, and mounds. Post-contact sites consisted of agricultural clearing mounds. Human skeletal remains were noted eroding out of sand dunes along the coast but were not assigned as historic properties. No historic properties were identified in the vicinity of the current project area.

In 1991, CSH conducted an archaeological inventory survey for the proposed Po'ipulani Golf Course and residential development consisting of 160 acres located in the *makai* eastern portion of Kōloa along the Kōloa-Weliweli *ahupua'a* boundary (Hammatt et al. 1991). Although the study area was observed to have been heavily disturbed by 19th century sugar cultivation and cattle ranching, significant remnants of pre-contact indigenous Hawaiian habitation and agriculture were documented. 75 historic properties were identified including both pre- and post-contact sites. Pre-contact historic properties consisted of habitations (platforms and enclosures), agricultural features ('auwai, field walls, terraces, and earthen mounds) and human burials; Post-contact historic properties consisted of a single house platform associated with an LCA and a brick and mortar corral.

An analysis of site location maps generated during the 1991 CSH study, indicate 11 historic properties in the immediate vicinity of the current project area (Figure 15). Documented historic properties consist of pre-contact and early post-contact Hawaiian habitation and agricultural structures. Habitation structures consisted of a stacked stone platforms (SIHP -909, -952), an enclosure (-954) a C-shaped terrace (-910), and a probable burial platform (-953); agriculture structures consisted of mounds (SIHP -906, -955), terraces (SIHP -948), field walls (-906, -948), and 'auwai (-972). A railroad berm segment associated with post-contact sugar cultivation (SIHP -947) was also identified in the vicinity of the current project area as well as a post-contact road (SIHP -992). SIHP -947 and -992 were recommended for preservation; data recovery was recommended for SIHP -909, -948, -952, -954, -955, and -972; and no further work was recommended for SIHP -906 and -910.

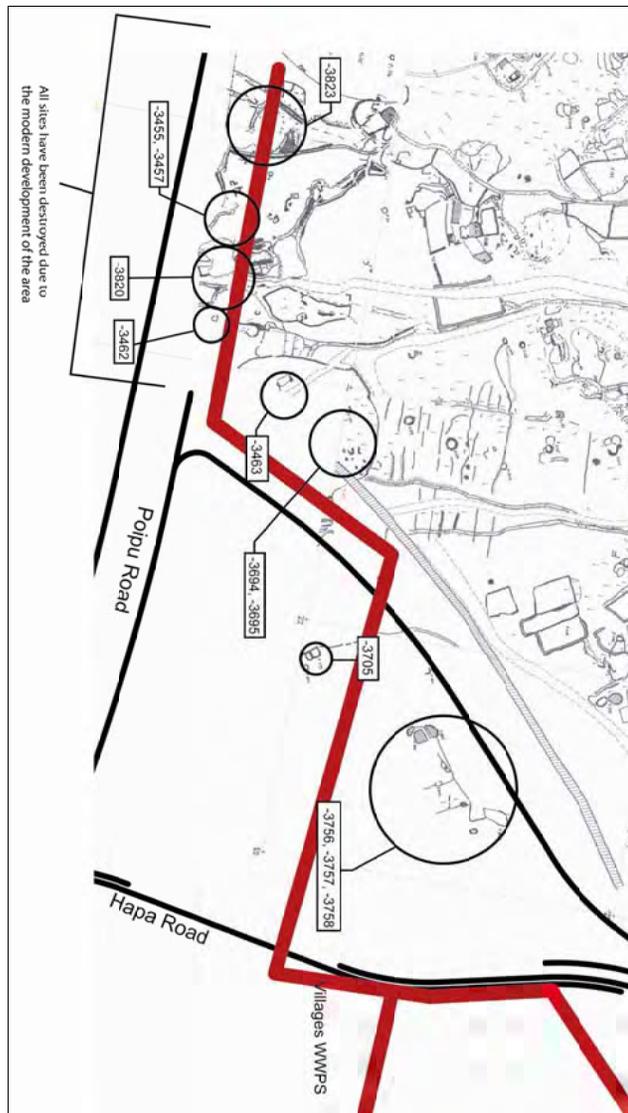


Figure 14. Portion of Kahauna Golf Village study area archaeological site location map, showing historic properties in the immediate vicinity of the project area (source: adapted from Hammatt et al. 1978)

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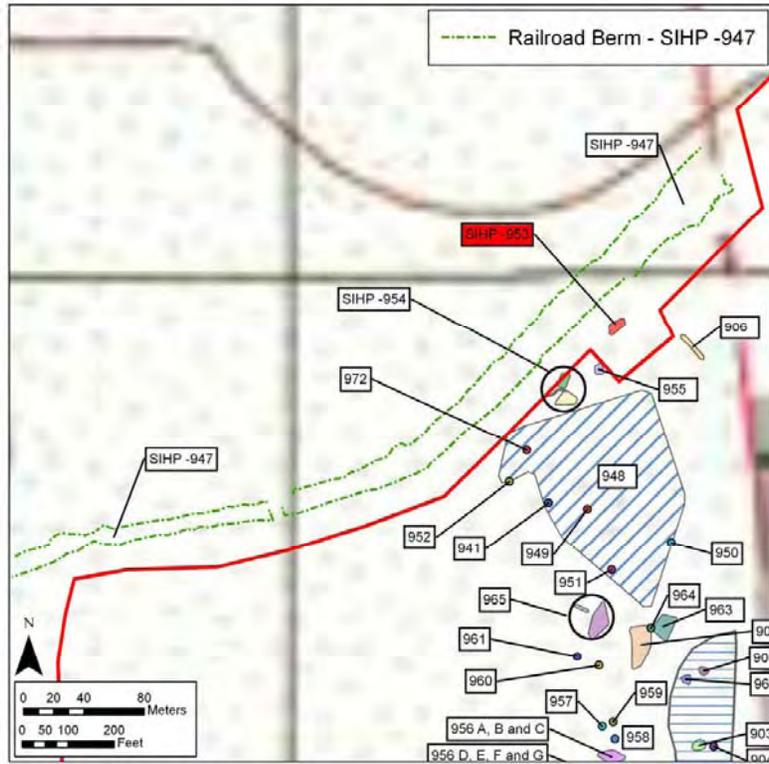


Figure 16. Portion of Po'ipulani Golf Course study area archaeological site location map, showing historic properties in the immediate vicinity of the project area (source: adapted from Simonson et al. 2009)

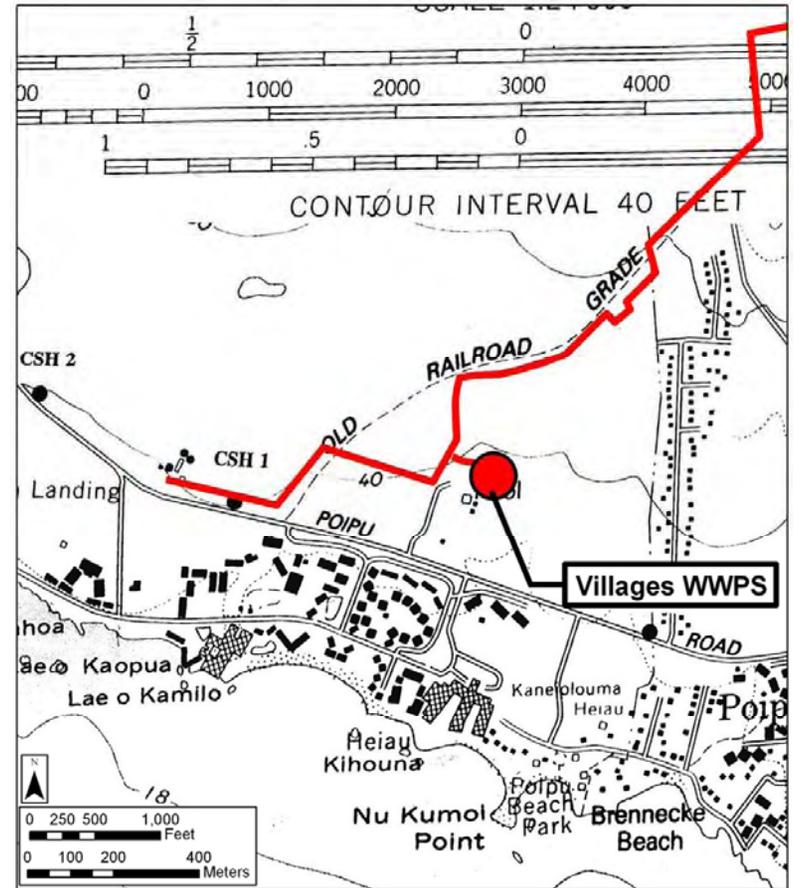


Figure 17. Creed et al. (1995) archaeological site location map, showing historic properties in the immediate vicinity of the project area (source: adapted from Creed et al. 1995)

In 2005, CSH conducted an inventory survey of an 8.633-acre parcel for the Eric A. Knudsen Trust Lands (Hill et al. 2005b). One historic property was identified: SIHP #50-30-10-3926, an elevated metal irrigation flume constructed in 1902. No further work was recommended for SIHP #50-30-10-3926.

In 2005, CSH conducted an archaeological inventory survey of a 9.348-acre parcel in Kōloa Town, located on the east bank of Waikomo Stream (Hill et al 2005c). Six historic properties were identified: SIHP -3930, a post-contact boundary wall; SIHP -3931, a pre-contact / post-contact terrace; SIHP - 3932, a post-contact irrigation reservoir; SIHP -3933, a post-contact house foundation; SIHP -3934, a post-contact irrigation ditch; and SIHP -3935, a pre-contact / post-contact stacked rock wall. SIHP -3930 to -3932 and -3935 were recommended for preservation, and SIHP -3933 and -3934 were recommended for data recovery.

In 2005, CSH conducted an archaeological inventory survey of a 8.15-acre Knudsen Trust Parcel, located just southeast of Anne Knudsen Park (Hammatt 2005). One historic property was identified: SIHP #50-30-10-3922, an earthen berm associated with a former plantation road and railroad. No further work was recommended for SIHP #50-30-10-3922.

In 2007, CSH conducted an archaeological inventory survey 10-acre Knudsen Trust Parcel, located along the *makai* edge of Weliweli Road (Tulchin et al. 2007). One historic property was identified: SIHP #50-30-10-5002, a post-contact stone wall. No further work was recommended for SIHP #50-30-10-5002.

3.3 Background Summary and Predictive Model

From previous archaeological studies and historic accounts it appears that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. As an extensive irrigated complex, the Kōloa Field System was used to divert the waters of the Waikomo Stream for taro, native sugar, and fish.

In the early post-contact era (1795-1880), the Kōloa Field System continued in use for foreign trade and was probably further intensified. Sweet potatoes were a main crop for the whaling and merchant ships, and the purchase of pigs, salt, oranges and other items are noted in many ship journals.

Documents of the Great Māhele show that by the mid-1800s there were still several traditional farmers within Kōloa who both lived and worked within the area. The individual claims – for both *lo'i* (wetland) and *kula* (dryland) suggest that while traditional farming of taro for subsistence was still taking place, in *kula* lands – sugar cane production for sale to the nearby sugar mill, had begun to dominate the landscape. Of the LCAs within Kōloa, several claim a *kula* planted with cane or a cane field or sugar cane garden. Several also identify cane lands as boundaries for the LCAs.

Within three years of sugar cultivation by Ladd and Company in 1835, residents in and surrounding Kōloa were quickly moving to adapt to the new economy based on the production of sugar cane. Eventually, most of inland Kōloa was planted with sugar cane and only the rockiest areas, unsuitable for cultivation, survived the dramatic changes in the landscape brought about during the early 20th century. A 1935 map of Koloa Sugar Company shows the extensive cane lands within the project area (see Figure 7).

The Koloa Sugar Company had previously purchased the *ahupua'a* of Pā'ā southeast of Kōloa town. A new mill was built in Pā'ā in 1912 about a mile from Kōloa Town, and in the immediate vicinity of the proposed Regional WRF (see Figure 9). The mill in Pā'ā was finally closed in 1996.

By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline. Although the town had established a Civic Center in 1977, the pace of tourism-driven development at the shoreline drew construction and service jobs away from the town center.

Based on background research, historic properties (i.e. archaeological sites) in the form of pre- and post-contact surface architecture may be encountered during the archaeological inventory survey of the project area. Historic research has indicated five LCAs in the vicinity of the project area, suggesting indigenous Hawaiian land use in the form of habitation and agriculture. Previous archaeological research has documented evidence of both pre- and post contact land use in the area.

Evidence of indigenous Hawaiian land use could include both habitation (platforms, enclosures, and C-shapes) and agricultural (terraces, mounds, field walls, etc.) features. Evidence of post-contact land use is likely to be associated with historic sugarcane cultivation and could include irrigation infrastructure (ditches and flumes), sugar transport infrastructure (road causeways, railroad berms, etc.), clearing mounds, and boundary walls..

It should be noted that the due to the extensive sugarcane cultivation documented within the project area, mechanized land modifications associated with sugarcane cultivation has likely disturbed and/or destroyed any pre-contact historic properties that may have been present. Additionally the project area is situated primarily within in-use roadways and old cane haul roads, which have caused additional land modifications within the project area, disturbing and/or destroying historic properties. Thus the probability of encountering surface historic properties during the pedestrian inspection is low.

Section 4 Results of Fieldwork

CSH completed the archaeological assessment fieldwork under state archaeological permit No. 09-20 issued by SHPD, per HAR Chapter 13-13-282. Missy Kamai, B.A., and Gerald Ida, B.A., conducted the fieldwork, which required 10 person-days to complete. Fieldwork took place between January 12th and 16th 2009 under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). Fieldwork involved a complete pedestrian inspection of the project area.

4.1 Survey Findings

A 100% pedestrian inspection of the project area relocated three previously identified historic properties (SIHP) #'s 50-30-10-954, -955, and -992) within the project area (Figure 18 & Table 5). Identified historic properties consisted of pre-contact traditional Hawaiian archaeological features associated with habitation as well as a post-contact road. Detailed descriptions of all identified historic properties are presented in the following section of this report.

Of note is the presence of two previously identified historic properties located in the immediate vicinity of the project area: SIHP #50-30-10-947, a stacked basalt railroad berm associated with Koloa Plantation; and SIHP #50-30-10-953, a pre-contact probable burial platform constructed of stacked basalt boulders. Both historic properties are located approximately 25 m *mauka* (north) of the *makai* (seaward) portion of the project area which is proposed for the development of the Po'ipū Collection System (see Figure 18). Both historic properties were originally identified by CSH in 1991, and were recommended for preservation (Hammatt et al. 1991). Due to the close proximity of these two preservation sites to the project area CSH recommends consultation with the State Historic Preservation Division Archaeology Branch prior to any land disturbance associated with the construction of the proposed Po'ipū Collection System.

The pedestrian inspection also confirmed that modern development had destroyed SIHP - 3455, -3457, -3462, -3820, and -3823, all previously identified by Hammatt et al in 1978, and located at the southwestern end of the project area (Po'ipū Collection System).

Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility (Figure 19). A review of historic documents indicates that this building was constructed by at least 1912 as a component of the Koloa Plantation. Due to the historic nature of these structures CSH recommends consultation with the State Historic Preservation Division Architecture Branch prior to any land disturbance associated with the construction of the proposed Regional WRF.

The relatively small number of historic properties observed within the project area can be attributed to the majority of it consisting of narrow linear corridors situated within old cane haul roads and asphalt paved roadways, as well as the project area being located within lands that have been under cultivation for over a century. The pedestrian inspection of the project area confirmed that almost the entire project area has been disturbed through land modifications (i.e. grading via bulldozing, excavations for utilities, etc.) associated with historic sugarcane cultivation, as well as modern agriculture and urban development (Figure 20).

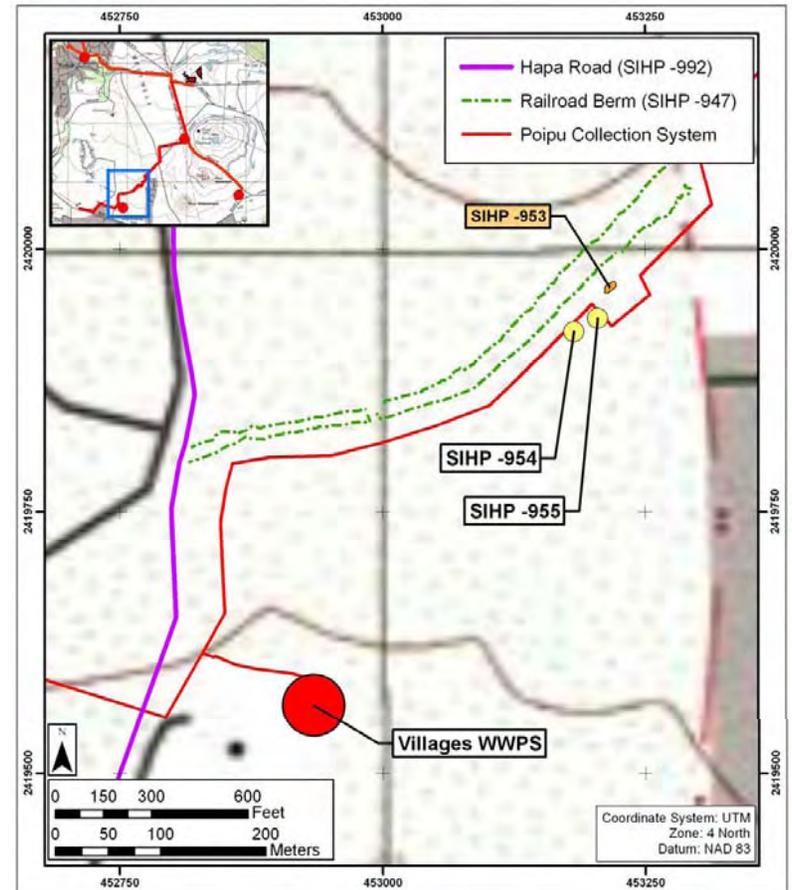


Figure 18. Portion of USGS 7.5 Minute Series Topographic Map, Kōloa Quadrangle (1996), showing the locations of historic properties identified within the project area

Table 5. Historic Properties Identified within the Project Area

SIHP # (50-30-10)	Site Type	Features	Age	Function	Significance Criteria	Mitigation Recommendations
-954	Enclosure, terrace, and platform	2	Pre-contact	Habitation	D	No Further Work
-955	Platform	1	Pre-contact	Habitation	D	No Further Work
-992	Dirt road with parallel stacked stone boundary walls	1	Post-contact	Transportation	C & D	Preservation



Figure 19. Photograph of historic sugar mill facility in the immediate vicinity of the proposed location of the Regional WRF, view to west

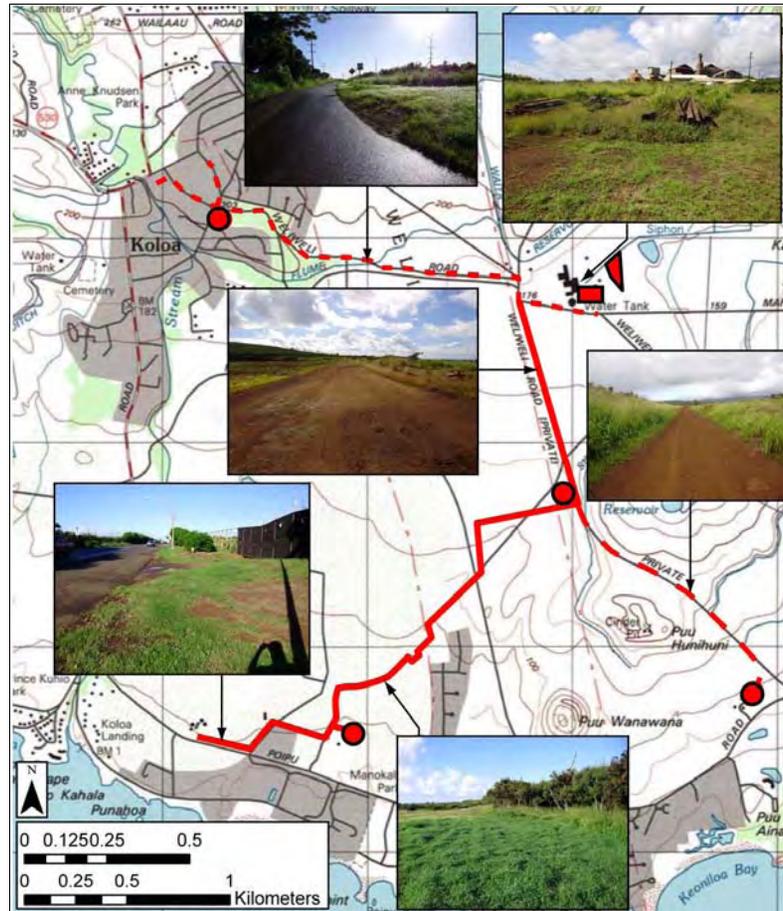


Figure 20. Photographic collage showing representative examples of areas of disturbance observed throughout the project area

4.2 Historic Property Descriptions

4.2.1 SIHP #50-30-10-954

FORMAL TYPE:	Enclosure, terrace, and platform
FUNCTION:	Habitation
# OF FEATURES:	2
AGE:	Pre-contact
DIMENSION:	10 m N/S by 6.3 m E/W
LOCATION:	Southwestern portion of project area (see Appendix A)
TAX MAP KEY:	[4] 2-8-014: 037
LAND JURISDICTION:	Private, E.A. Knudsen Trust

SIHP #50-30-10-954 was initially described in the *Archaeological Inventory Survey of the Proposed Po'ipulani Golf Course and Residential Development Kōloa Kau'i* (Hammatt et al. 1991) as follows:

This is a temporary habitation enclosure with external dimensions of 20' (6.1 m) and a roughly oval shape. The walls are 3-5' (0.9-1.5 m) high and 4-5' (1.2-1.5 m) wide of stacked boulders. The center of the enclosure contains a 2' (0.6 m) deep depression. An 'auwai branch section abuts the structure on the southwest and southeast sides. No artifacts or midden were observed. The structure is partly disturbed by surrounding bulldozing and is judged to be pre-contact in age.

In 2007, CSH archaeologists relocated SIHP -954, located it with GPS, remapped the site, and modified the description as follows (Simonson et al. 2009):

Feature A of Site 954 is a pre-contact, circular habitation enclosure with a small attached agricultural terrace on the NE side (Figure 21 and Figure 22). The entire site measures 10 meters by 6.3 meters with a maximum height of 0.74 meters. It is constructed of stacked basalt boulders in 2 to 4 courses, with cobble fill in some areas. Vertical facing is present at the western exterior of the enclosure, the W and E sides of the interior, and along portions of the terrace. The interior of the enclosure is 2.0 meters in diameter, and there is an entrance on the south side. Much of the exterior is filled with rubble from the collapse of the wall on the N side. The terrace measures 5 meters by 3 meters. Site 971, an 'auwai, passes adjacent to the S of the feature. Bulldozed areas surround this site, which is located on gently sloping terrain with bedrock outcrops. Vegetation includes *koa haole*, cacti and unidentified grasses. The condition of the feature is good and the excavation potential is good due to it likely being a habitation site.



Figure 21. SIHP -954 Feature A plan view



Figure 22. SIHP -954 Feature A enclosure

Feature B of Site 954 is likely a pre-contact habitation platform measuring 14 meters by 10 meters with a maximum height of 1.0 meter (Figure 23 and Figure 24). Construction incorporates a bedrock outcrop and many in situ bedrock boulders. The surface is roughly paved with boulders and cobbles. On the NE side, two (2) rough boulder/cobble terraces extend outward toward the NE. The two (2) terraces are 2.0 and 3.0 meters long, and are bulldozed at their NE ends. No cultural material was observed on the surface. No facing exists, likely due to rock removal from the structure. Vegetation includes *koa haole*, cacti, and unidentified grasses. This is a newly restored feature. The condition is poor and the excavation potential is fair due to much of the central portion of the feature being intact.

In 2007, CSH also conducted data recovery excavations at SIHP -954 (Simonson et al. 2009). Two 1 m by 1 m test units (TU 1 & 2, see Figure 21) were placed within SIHP -954A. Test excavations revealed a buried cultural layer containing marine shell and faunal bone midden, basalt flakes, fire-cracked rock, and charcoal.

4.2.2 SIHP #50-30-10-955

FORMAL TYPE:	Platform
FUNCTION:	Habitation
# OF FEATURES:	1
AGE:	Pre-contact
DIMENSION:	8.4 m by 6.3 m
LOCATION:	Southwestern portion of project area (see Appendix A)
TAX MAP KEY:	[4] 2-8-014: 037
LAND JURISDICTION:	Private, E.A. Knudsen Trust

SIHP -955 was initially described in the *Archaeological Inventory Survey of the Proposed Po'ipulani Golf Course and Residential Development Kōloa Kaua'i* (Hammatt et al. 1991) as follows:

This is a pre-contact agricultural mound located 50' (15.2 m) to the east of Site 954. The mound measures 8' (2.4 m) in diameter and has a maximum height of 2' (0.6 m). There are clearly defined facings along the edges. No midden or artifacts were observed.

In 2007, CSH archaeologists relocated SIHP -955, located it with GPS, remapped the site, and modified the description as follows (Simonson et al. 2009):

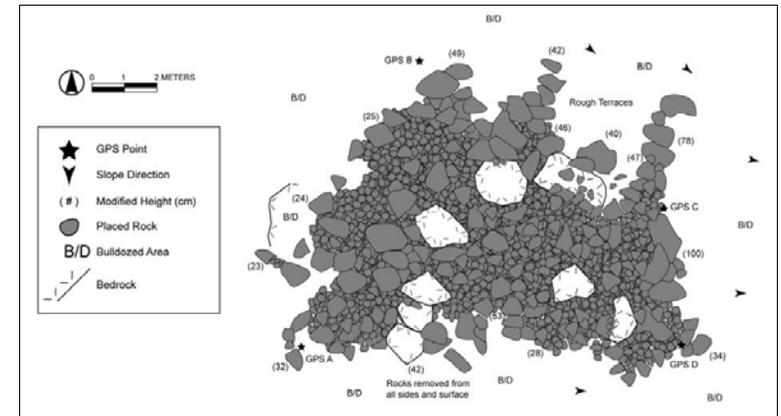


Figure 23. SIHP -954 Feature B plan view



Figure 24. SIHP -954 Feature B platform/modified outcrop

Site 955 is a 6.1 meter (N/S) by 5.7 meter platform (Figure 25 & Figure 26). The platform is constructed of basalt boulders and cobbles of various sizes stacked two (2) to six (6) courses high with a maximum height of 1.0 meter. The facing along the west end of the platform is very distinct and in excellent condition compared to the rest of the sides. At the north, northeast end of the platform, intensive rock removal took place. All that remains is an outline of small basalt boulders. There is a 1.8 meter (NE/SW) by 1.1 meter (NW/SE) low wall constructed of basalt boulders and cobbles stacked one (1) to two (2) courses high with a maximum height of 0.25 meters. The site is situated on a gently sloping area with a dozed road just east of it. Due to the construction and height of the wall as well as the size, it is possible that this site is a burial. Vegetation consisted of cacti and *koa haole*.

In 2007, CSH also conducted data recovery excavations at SIHP -954 (Simonson et al. 2009). Two 1 m by 1 m test units (TU 1 & 2, see Figure 25) were placed within SIHP -954A. Test excavations revealed a buried cultural layer containing a hearth, marine shell and faunal bone midden, basalt flakes, fire-cracked rock, and charcoal.

Test excavation findings ruled out the initial determination of the site having a possible burial function. Based upon the presence of the midden and the hearth, the function of SIHP -955 was determined to be habitation.

4.2.3 SIHP #50-30-10-992

FORMAL TYPE:	Dirt road with stacked stone boundary walls
FUNCTION:	Transportation
# OF FEATURES:	1
AGE:	Post-contact
DIMENSION:	750+ m long by 7.3 m wide
LOCATION:	Southwestern portion of project area (see Appendix A)
TAX MAP KEY:	[4] 2-8-014: 021 & 030
LAND JURISDICTION:	Private, E.A. Knudsen Trust

SIHP #50-30-10-992 was first described in 2004 in the *Archaeological Inventory Survey For Parcel 30 of the Eric A. Knudsen Trust Lands, Kōloa Ahupua'a, Kona District, Kaua'i Island* (Hammatt et al. 2004) as follows:

Site 50-3-10-992 is a stacked boulder wall on both sides of Hapa Road, which runs between Po'ipū Road and Kōloa Town. The road's west wall adjoins the east side of the project area. In some areas the wall has been reduced to its foundation by rock thieving. Along its length the original alignment of the wall is still

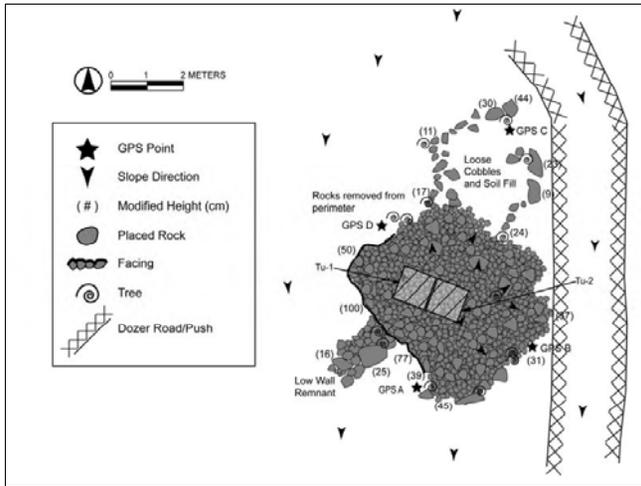


Figure 25. SIHP-955, site plan view



Figure 26. SIHP -955 platform

traceable even though the bulk of the rocks are gone. Much of the wall is core-filled construction (Hammatt et al. 2004: 26).

SIHP -992 roughly runs in a north-south direction with the current project area bisecting it approximately 164 m *mauka* (inland) of Po'ipū Road (Figure 27). The portion of SIHP -992 observed within the project area consisted of two 3 m long stacked basalt boulder wall remnants bordering a dirt roadway. The boundary wall segments measured approximately 10 to 50 cm high and 0.8 to 1.0 m wide, and were constructed of basalt boulders and cobbles stacked 2-3 courses high (Figure 28). The two wall remnants border a dirt roadway measuring approximately 6 m wide.

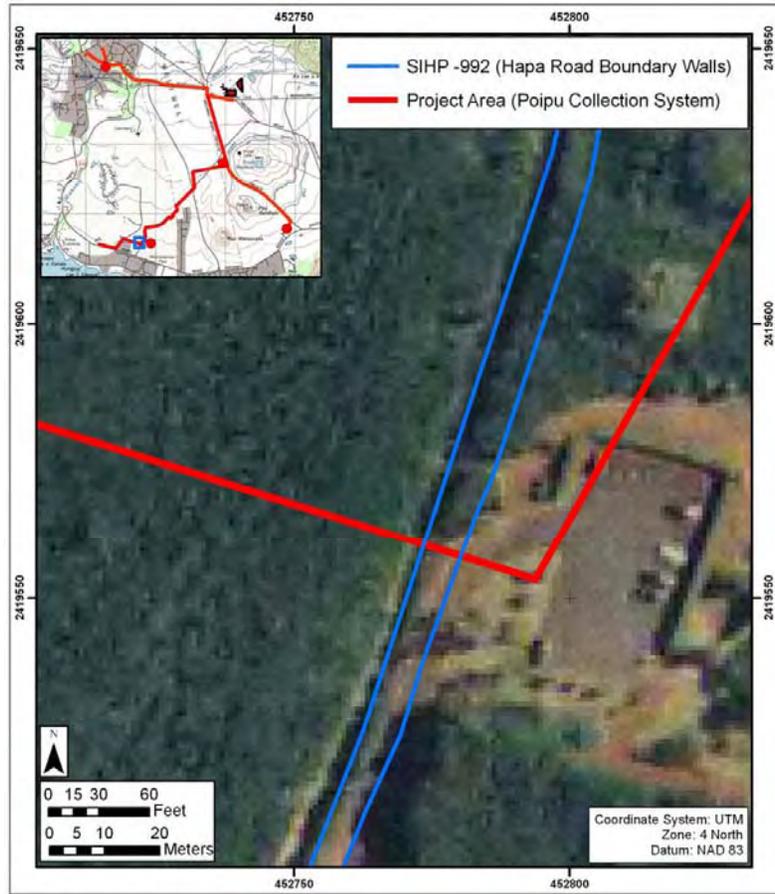


Figure 27. GPS map of SIHP -992 (Hapa Road)



Figure 28. Photograph of SIHP -992 (Hapa Road), view to northeast

Section 5 Summary and Interpretation

In compliance with and to fulfill applicable Hawai'i state historic preservation legislation, CSH completed this archaeological inventory survey investigation for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System.

Per the Hawai'i state requirements for archaeological inventory surveys [HAR Chapter 13-276], this inventory survey investigation includes the results of cultural, historical, and archaeological background research and fieldwork. The background research focused on summarizing the project area's pre-contact and post-contact land use, cultural significance, and types and locations of potential historic properties within the project area and its vicinity.

Pedestrian inspection of the project area identified three historic properties: SIHP #50-30-10-954, a pre-contact habitation enclosure, terrace, and platform; SIHP #50-30-10-955, a pre-contact habitation platform; and SIHP #50-30-10-992, a post-contact dirt road with parallel stacked stone boundary walls. All three historic properties are located within the southwestern portion of the project area within an area that is proposed for the development of the Po'ipū Collection System component of the Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System.

All three historic properties (SIHP -954, -955, & -992) observed within the project area were previously identified by CSH in 1991 during an archaeological inventory survey for the proposed Po'ipulani Golf Course and residential development (Hammatt et al. 1991). Additionally, in 2009, SIHP -954 and SIHP -955 were subjected to data recovery in the form of subsurface testing (Simonson et al. 2009). Test excavations revealed that both historic properties were utilized sporadically as temporary habitations, providing shelter to pre-contact and early post contact indigenous Hawaiians while they tended to nearby agricultural fields and associated infrastructure, all of which is part of an elaborate agricultural complex known as the Kōloa Field System.

Of note is the presence of two previously identified historic properties located in the immediate vicinity of the project area: SIHP #50-30-10-947, a stacked basalt railroad berm associated with Koloa Plantation; and SIHP #50-30-10-953, a pre-contact probable burial platform constructed of stacked basalt boulders. Both historic properties are located approximately 25 m *mauka* (north) of the *makai* (seaward) portion of the project area which is proposed for the development of the Po'ipū Collection System (see Figure 18). Both historic properties were originally identified by CSH in 1991, and were recommended for preservation (Hammatt et al. 1991). Due to the close proximity of these two preservation sites to the project area CSH recommends consultation with the State Historic Preservation Division Archaeology Branch prior to any land disturbance associated with the construction of the proposed Po'ipū Collection System.

Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility (see Figure 19). A review of historic documents indicates that this building was constructed by at least 1912 as a component of the Koloa Plantation. Due to the historic nature of these structures

CSH recommends consultation with the State Historic Preservation Division Architecture Branch prior to any land disturbance associated with the construction of the proposed Regional WRF.

The current archaeological inventory survey investigation also confirmed extensive post-contact and modern disturbances throughout the project area. A majority of the project area is situated within either asphalt paved or dirt roads that would have involved grading, cutting, and/or filling during road construction. Other smaller portions of the project area are situated within fallow fields that were being cultivated for decades prior to abandonment. The presence of only three historic properties within the entire project area can be attributed to these observed land modifications.

The findings of this archaeological inventory survey are largely in keeping with expectations. Background research has indicated that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. Waters diverted from Waikomo Stream were utilized for the cultivation of taro and native sugar, and for fish aquaculture. Previous archaeological studies have documented extensive pre-contact indigenous Hawaiian habitation and agriculture within and in the immediate vicinity of the southwestern portion of the project area, where the current investigation documented the presence of two historic properties of pre-contact origin.

During the post-contact period, a majority of the project area was utilized for the cultivation of sugarcane. Historic maps indicate extensive sugarcane fields and sugar transport infrastructure (railroad tracks and berms), as well as sugarcane processing facilities (sugar mill) within and in the immediate vicinity of the project area. Previous archaeological research has identified remnants of sugarcane infrastructure, in the form of abandoned railroad berms and irrigation flumes in the vicinity of the western portion of project area.

Based on background research, it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area, an area proposed for the development of the Po'ipū Collection System. This area has been determined to be within what is known as the Kōloa Field System, an extensive network of irrigated agricultural complexes and associated habitations located within central and coastal Kōloa. Evidence of pre-contact land use could be in the form subsurface cultural deposits containing human burials, midden deposits, and artifacts (i.e. stone tools).

Section 6 Significance Assessments

The inventory survey investigation has documented three previously identified historic properties within the project area. Significance for all three historic properties was previously assessed by CSH in 1991 during a prior archaeological inventory survey of the project area (Hammatt et al. 1991). Significance is determined after evaluation of the historic property in light of the five broad criteria used by the Hawai'i State Register of Historic Places (HAR 13-284-6). The criteria are the following:

- A Historic property reflects major trends or events in the history of the state or nation.
- B Historic property is associated with the lives of persons significant in our past.
- C Historic property is an excellent example of a site type.
- D Historic property has yielded or may be likely to yield information important in prehistory or history.
- E Historic property has cultural significance to an ethnic group, including, but not limited to, religious structures, burials, and traditional cultural properties.

SIHP #50-30-10-954, a pre-contact habitation enclosure, terrace, and platform, has integrity of location and materials, and was recommended eligible to the Hawai'i Register under criteria D.

SIHP #50-30-10-955, a pre-contact habitation platform, has integrity of location and materials, and was recommended eligible to the Hawai'i Register under criteria D.

SIHP #50-30-10-992, post-contact dirt road with parallel stacked stone boundary walls, has integrity of location and materials, and was recommended eligible to the Hawai'i Register under criteria C and D.

Section 7 Project Effect and Mitigation Recommendations

7.1 Project Effect

CSH's project specific effect recommendation is "effect, with proposed mitigation commitments." The recommended mitigation measures will reduce the project's effect on identified significant surface historic properties as well as any yet to be identified subsurface historic properties that may be located within the project area and be pro-active in addressing possible community concerns.

7.2 Mitigation Recommendations

To reduce the proposed project's potential adverse effect on significant historic properties, the following mitigation measures are recommended. The mitigation measures should be completed prior to any land disturbing activities within the project area.

No further historic preservation work is recommended for SIHP #50-30-10-954 and SIHP #50-30-10-955. Sufficient information regarding the location, function, age, and construction methods of SIHP #50-30-10-954 and SIHP #50-30-10-955 have been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities. Additionally both historic properties were previously identified and documented by CSH in 1991 (Hammatt et al. 1991) and in 2009 were subjected to data recovery in the form of subsurface testing (Simonson et al. 2009).

It is recommended that a cultural resource preservation plan be prepared for the proposed - Po'ipū Regional Wastewater Reclamation Facility and Collection System project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP #50-30-10-992, a post-contact road located within the southwestern portion of the project area. This historic property was previously identified by CSH in 1991 and was recommended for preservation (Hammatt et al. 1991). Additionally the recommended cultural resource preservation plan should also address SIHP #50-30-10-947 (post-contact railroad berm) and SIHP #50-30-10-953 (pre-contact probable burial platform), which are located in the immediate vicinity of the southwestern portion of the project area and are also recommended for preservation. This preservation plan should detail the short and long term preservation measures that will safeguard the historic properties during project construction and subsequent use of the project area.

Based on background research, it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area, an area proposed for the development of the Po'ipū Collection System. This area has been determined to be within what is known as the Kōloa Field System, an extensive network of irrigated agricultural complexes and associated habitations located within central and coastal Kōloa. Evidence of pre-contact land use could be in the form subsurface cultural deposits containing human burials, midden deposits, and artifacts (i.e. stone tools). In order to mitigate the potential damage to these potential historic properties within the *makai* portion of the project area, it is recommended that project construction proceed under an archaeological monitoring program.

This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered. The specifics archaeological monitoring will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division.

Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility (see Figure 19). A review of historic documents indicates that this building was constructed by at least 1912 as a component of the Koloa Plantation. Due to the historic nature of these structures CSH recommends consultation with the State Historic Preservation Division Architecture Branch prior to any land disturbance associated with the construction of the proposed Regional WRF.

7.3 Disposition of Materials

No cultural materials were collected during this archaeological inventory survey.

Section 8 References Cited

Alexander, Arthur, C.

1937 *Koloa Plantation 1835-1935*, Kauai Historical Society, Lihue, Kaua'i.

Bennett, Wendell C.

1931 *The Archaeology of Kaua'i*, Bernice P. Bishop Museum Bulletin 80, Honolulu, Hawai'i.

Boundary Commission

1874 "Boundary of the Ahupua'a of Kōloa," as published in the *Boundary Commission Report, Kauai, Vol. 1*, State Archives, Honolulu, HI.

Conde, Jesse C.

1993 "Fowler Locomotives in the Kingdom of Hawaii", as published in *The Narrow Gauge*, Alan Burgess, Editor, 22 Peveril Road, Peterborough, PE 1 3PY, England

Creed, Victoria, Gerald Ida, and Hallett Hammatt

1995 An Archaeological Inventory Survey for Po'ipū Road Safety Improvements, Po'ipū, Kaua'i, (TMK: 2-8-15, 16, 17 & 18), Cultural Surveys Hawai'i, Kailua, Hawai'i.

Damon, Ethel M.

1931 *Koamalu: A Story of Pioneers on Kauai and of What They Built in that Island Garden*. Privately Published, Honolulu, Hawai'i.

Donohugh, Donald L.

2001 *The Story of Kōloa, A Kaua'i Plantation Town*, Mutual Publishing, Honolulu.

Dorrance, William H. and Francis S. Morgan

2000 *Sugar Islands: The 165-Year Story of Sugar in Hawaii*, Mutual Publishing, Honolulu.

Farley, J. K.

1907 "Notes on Maulili Pool, Kōloa", as published in *Thrum's Almanac 1907*, Honolulu.

Foote, Donald E., E. L. Hill, S. Nakamura and F. Stephens

1972 *Soil Survey of the Islands of Kaua'i, O'ahu, Maui, Moloka'i and Lana'i*, State of Hawaii, U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.

Foreign Testimony

1848 *Foreign Testimony of Kuleana Claims to Quiet Land Titles in the Hawaii Islands*, State of Hawaii Archives, Honolulu, HI.

Giambelluca, Thomas W., Michael A. Nullet and Thomas A. Schroeder

1986 *Rainfall Atlas of Hawai'i*, Department of Land and Natural Resources, Honolulu.

Hammatt, Hallett H.

2005 Archaeological Inventory Survey of an 8.15-acre Knudsen Trust Parcel, Kōloa Ahupua'a, Kona District, Island of Kaua'i TMK: (4) 2-8-004: por. 003 & 055. Cultural Surveys Hawaii, Inc., Kailua, Hawaii.

- Hammatt, Hallett H., R.M. Bordner and M. J. Tomonari-Tuggle**
1978 Archaeological and Biological Survey of the Proposed Kīahuna Golf Village Area, Kōloa, Kona, Kaua'i Island, Hawai'i, A.R.C.H., Lāwa'i, Kaua'i.
- Hammatt, Hallett H., William H. Folk, and Mark Stride**
1991 Archaeological Inventory Survey of the Proposed Po'ipulani Golf Course and Residential Development, Kōloa, Kaua'i (Revised July 1991), CSH Inc., Kailua, Hawai'i.
- Hammatt, Hallett H., Gerald K. Ida, Sarah Masciangelo, and William Folk**
2004 Archaeological Inventory Survey for Parcel 30 of the Eric A. Knudsen Trust Lands, Kōloa Ahupua'a, Kona District, Kauai Island, TMK: (4) 2-8-014: 30, Cultural Surveys Hawaii, Inc., Kailua, Hawaii.
- Hammatt, Hallett H., Dominique Cordy, Uta Rainalter, Paul Gomes, David W. Shideler, and William H. Folk**
2005 Archaeological Inventory Survey and Data Recovery Of The Kiahuna Golf Village and KMP Development Project Parcels in Approximately 400 Acres at Kōloa Ahupua'a, Kona, Kaua'i Island, Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Hill, Robert R., John E. Dockall and Hallett H. Hammatt**
2005a Inventory Survey of an Approximately 10.6-Acre Parcel at Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-15: 43, 44, 82, Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.
- Hill, Robert R., Todd Tulchin, Jon Tulchin, and Hallett H. Hammatt**
2005b Archaeological Inventory Survey of an 8.633 Acre Parcel at Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-014: 001 Mauka Portion, Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.
2005c Inventory Survey of an Approximately 9.348-Acre Parcel at Kōloa, Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-009: 001, Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.
- Judd, Bernice**
1935 "Koloa, A Sketch of Its Development", as held within the *Kauai Historical Society Papers, Volume II*, Honolulu.
- Kikuchi, William K.**
1963 Archaeological Survey and Excavations on the Island of Kaua'i, Kona District, Unknown publisher.
1981 Reconnaissance Survey, Archaeological Sites Weliweli Tract, TMK 2-8-22, Porō, Kōloa District, Island of Kaua'i.
- Lahainaluna Schools**
1885 "Heiaus and Fishing Grounds [of Koloa, Kauai]", (translation), HMS 43, #17.
- Mission Houses Museum**
1970 *Missionary Album Sesquicentennial Edition 1820-1970*, published by the Hawaiian Mission Children's Society, Honolulu.

- Missionary Herald**
1827 Journal of the Missionaries at Honolulu, February 17, 1821. *Missionary Herald* XVIII (June 1827:12).
- Monsarrat, M.D.**
1891 Map: Hawaii Territorial Survey, Koloa. "Traced from M.D. Monsarrat circa 1891 Government Survey Map 1694", by T. B. Butch and E. J. Grube, September 1918.
- Native Register**
1847 Native Register of Kuleana Claims to Quiet Land Titles in the Hawaii Islands, State of Hawaii Archives, Honolulu, HI.
- Native Testimony**
1847 Native Testimony of Kuleana Claims to Quiet Land Titles in the Hawaii Islands, State of Hawaii Archives, Honolulu, HI.
- Palama, Stephen L., and Catherine Stauder**
1973 The Archaeology of Kona, Kaua'i from the Ahupua'a of Kōloa to the Ahupua'a of Weliweli: Archaeological Reconnaissance of the Proposed Cane Haul Road to the Kōloa Mill for McBryde Sugar Co., Ltd., A.R.C.H., Lāwa'i, Kaua'i.
- Pukui, Mary Kawena, Samuel H. Elbert, and Ester T. Mookini**
1974 *Place Names of Hawaii*, University of Hawaii Press, Honolulu.
- Simonson, Mindy, Amy Hammermeister, Rosanna Runyon, and Hallett H. Hammatt**
2009 Archaeological Data Recovery Report for a portion of the Eric A. Knudsen Trust Lands, Kōloa Ahupua'a, Kona District, Island of Kaua'i (TMK: (4) 2-8-014:019 por.), Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.
- Thrum, Thomas G.**
1907 "Heiaus and Heiau Sites Throughout the Hawaiian Islands", as published in *Hawaiian Almanac and Annual for 1908*, compiled by Thomas G. Thrum, Honolulu.
- Townsend, John**
1839 Narrative of a Journey Across the Rocky Mountains...and a Visit to the Sandwich Islands and Chile..., H. Perkins and Marvin, Boston.
- Tulchin, Jon, and Hallett H. Hammatt**
2007 Archaeological Data Recovery for SIHP No. 50-30-10-0362, at the proposed Starwood Vacation Ownership Development Project, Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-015: 43, 44, & 82, Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.
- Tulchin, Jon, Amy Hammermeister and Hallett H. Hammatt**
2007 Archaeological Inventory Survey of an Approximately 10-Acre Knudsen Trust Parcel, Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: [4] 2-8-011:001. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.
- U.S. Geological Survey**
1910 (1912 Edition) Map: *Topographic Map of the Island of Kauai, Territory of Hawaii*, George Otis Smith, R.B. Marshall, U.S. Coast & Geodetic Survey, Washington, D.C.

Waihona 'Aina Corp.

2002 The Māhele Database and The Boundary Commission Database, as maintained by Project Director Victoria S. Creed, (Internet: www.waihona.com).

Walker, Allen T., and Paul H. Rosendahl

1990 Archaeological Data Recovery, Phase II, Hyatt Regency Kaua'i Mitigation Program, Paul H. Rosendahl, Inc., Hilo, Hawai'i.

Wichman, Frederick B.

1998 *Kauai: Ancient Place-Names and Their Stories*, University of Hawai'i Press, Honolulu.

Wilcox, Carol

1996 *Sugar Water: Hawaii's Plantation Ditches*, University of Hawai'i Press, Honolulu.

Wilkes, Charles, Commander U.S.N.

1845 Narrative of the United States Exploring Expedition During the Years...., Lea and Blanchard, Philadelphia, PA.

Appendix A UTM Information for Historic Properties

SIHP #50-30-10-954, UTM NAD 83, Zone 4 North (m)

NORTHING	EASTING
2419921.28	453181.85

SIHP #50-30-10-955, UTM NAD 83, Zone 4 North (m)

NORTHING	EASTING
2419933.47	453204.82

SIHP #50-30-10-992, UTM NAD 83, Zone 4 North (m)

NORTHING	EASTING
2419557.63	452780.40
2419558.58	452776.97
2419559.79	452773.67

Appendix E

An Historic Resources Survey of Koloa Mill

Mason Architects, Inc.

July 2009

An Historic Resources Survey of Koloa Mill

Project Background

HOH Utilities, LLC proposes to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Koloa-Poipu region on the south shore of the island of Kauai. The proposed wastewater collection system improvements would consist of a regional wastewater reclamation facility (Regional WRF) and four wastewater pump stations as well as gravity lines and force mains. The proposed location of the Regional WRF is off Weliweli Road on a portion of Tax Map Key 2-9-001:001, which includes the site of the sugar mill formerly utilized by Koloa Sugar Company (1913-1948), Grove Farm Plantation (1948-1974), and McBryde Sugar Company (1974-1996). The proposed project intends to incorporate and adaptively reuse the sugar mill's bagasse storage building and a water tank as part of the Regional WRF. The adaptive reuse of these buildings will most likely entail the removal of the conveyor system which transported the bagasse to and from the sugar mill building.

The present inventory survey was undertaken to gather sufficient information to assess the historic significance of the complex of buildings which constitute the former Koloa Sugar Company mill. The historic resources inventory forms were completed following a visit to the site on May 21-22, 2009, by Don Hibbard, Ph.D., and basic historic research concerning the site was undertaken, which included conversations with former McBryde Sugar Company employees Earl Smith on May 22, 2009 and Bob Bryan on May 21, 2009.

Historic Context

Ladd and Company, the predecessor to the Koloa Sugar Company although not the first to attempt to produce sugar in Hawaii, was the first to be somewhat successful in this endeavor. The story of their effort well reveals the changing character of Hawaiian society during the 1830s. Supported by a missionary desire to provide Hawaiians with "gainful" employment, Kamehameha III was influenced, in 1835, to grant Ladd and Company a fifty year lease and water rights for about one thousand acres of land in Koloa for \$300/year. This written, binding lease for such a large holding of land was unprecedented in Hawaii, as previously the monarchy only granted, in the vaguest of terms, the use of relatively small land parcels to foreigners. In addition to granting land and water rights, the lease exempted Hawaiians who worked for the plantation from paying taxes to their alii, thus undermining the authority of the Hawaiian rulers by giving commoners a new means of livelihood and obligation. The plantation further transformed the Hawaiian barter-based, subsistence economy by printing its own money, the first currency to be produced in the kingdom. The Koloa dollars were exchanged for goods at the plantation store, but soon circulated beyond the store, remaining in use on Kauai until at least 1850. The plantation also provided worker housing, and addressed medical needs, thereby establishing the foundations of the paternalistic plantation system which spread throughout the Islands and endured for over one hundred years.

Initially, twenty five acres of sugar cane were cultivated at Koloa, and in 1836 a dam was built to provide water power for turning a mill located at Maulili. Two years after its completion this rudimentary mill was replaced by a new mill at the same location. Ladd and Company was sufficiently successful to allow the construction of a larger sugar mill

in 1841 at Waihothonu, on lands leased to the Koloa Sugar Company by the Knudsen family. The stone stack of this mill still stands in the heart of Koloa town at the intersection of Maluhia and Koloa roads. The Waihothonu mill was updated in 1853, and in 1869 became the first steam powered mill on Kauai. It fulfilled the sugar company's needs for the remainder of the nineteenth century and into the twentieth century. (Alexander, page 69)

The present mill's location was the third and final mill site used by the Koloa Sugar Company. By 1912, it was apparent that the Waihothonu factory was outdated and required extensive repairs. In June 1912, the Koloa Sugar Company board of directors decided that rather than expend moneys on repairing and upgrading a mill that sat on leased land, it would be more prudent to construct a new mill on lands owned by the company. A site for the new factory was chosen in Paa, midway between Waita Reservoir (built 1903-1906) and Puuhi Reservoir, just below the former 1902 "Mill Ditch". At their meeting of July 18, 1912, the board accepted the offer of the Honolulu Iron Works to furnish materials, buildings, crushing machinery, and evaporating equipment for the new factory for a cost of \$242,000. Provision was made to reduce this cost, if it was found some of the old machinery could be installed in the new mill. (Alexander, pages 144-145)

Work was started in early 1913 on the foundations and various adjuncts to the factory, such as shops, warehouses, railroads and roads. Construction on the factory itself commenced on May 30, 1913 under the supervision of John Gribble, an engineer who worked for Honolulu Iron Works. The factory was completed in 1913, at an approximate cost of \$330,000. The new mill train had twelve rollers, 32" x 66" with a Krajewski crusher and automatic feeders to deliver the bagasse to the boilers. Kopke clarifiers, made in Hawaii, were initially used, but these proved unsatisfactory and in 1933 a three compartment Dorr clarifier was installed. (*Garden Island*, Gilmore, 1935-1936, page 170, and Alexander, pages 145-147)

The years immediately following the construction of the new mill were the most profitable for Koloa Sugar Company, in large part the result of the high sugar prices engendered by World War I. By 1919 Koloa Sugar Company was producing 9,000 tons of sugar with annual profits of nearly \$300,000. Following World War I the price of sugar dropped tremendously, but the introduction of tractors into the fields and other efficiencies resulted in greater sugar production, with 18,833 tons produced in 1933. Throughout the 1930s and 1940s, Koloa Sugar company confronted economic difficulties, and by 1946 the company found itself over one million dollars in debt. It appeared Koloa was destined to follow such other small plantations as Kipahulu, Hana, Waianae, and Waimanalo and go out of business.

At this time Koloa Sugar's neighboring plantation, Grove Farm, was also beginning to discover the economic disadvantages of a small operation. In addition, Grove Farm had no mill of its own, and Lihue Mill had raised its rates for grinding Grove Farm Plantation's cane. As a result in 1948 Grove Farm acquired Koloa Sugar Company, thereby doubling its acreage planted in cane and coming into possession of its own mill. Grove Farm constructed a tunnel through the mountain between its fields and Koloa Mill, substantially upgraded the mill, cleared the rock filled Koloa fields of enough stones to allow mechanization of the harvests, and inaugurated the use of tracks, rather than the railway, to transport the cane to the mill and the sugar to the docks.

Sugar in Hawaii continued to decline in the face of international competition. In the early 1970s Kahuku on Oahu, Kohala on the island of Hawaii, and Kilauea on Kauai, ceased operations. In 1974 Grove Farm decided to close as well, and leased its mill and surrounding lands to McBryde Sugar Company, while leasing its original Grove Farm lands to Lihue Plantation. McBryde shifted its milling operations to Koloa, as its own mill was in need of major improvements. McBryde closed its Numila mill near Eleele and transferred its best equipment to Koloa and also upgraded and expanded the Koloa Mill so that it could handle all of the company's harvest. The mill continued in operation for another twenty two years, but Hurricane Iniki destroyed much of the company's fields in 1991, and McBryde gradually phased out of sugar production, concluding its sugar operations in 1996, when it closed the mill.

The Buildings and Structures

The site visit discovered eight buildings and five structures associated with the former Koloa Sugar Company's mill site that remain standing. These included the following:

buildings:

1. bagasse storage building
2. sugar mill
3. parts warehouse
4. water pump sheds
5. office building
6. electric shop and laboratory
7. sugar bins
8. sugar storage building

structures:

1. water tank
2. molasses tank
3. day tank
4. foundations of former cleaning plant
5. stack

Of these buildings and structures, only the Bagasse Storage Building and Water Tank may be directly affected by the proposed wastewater treatment project. The remaining buildings and structures may be indirectly affected by the proposed project. All eight buildings and five structures were photographed, and historic resource forms were completed for each.

Of these buildings and structures, the sugar mill building, water pump sheds, sugar bins, sugar storage building, molasses and day storage tanks, and cleaning plant foundations are over fifty years old and appear to meet the criteria for listing in the Hawaii and National Registers of Historic Places. The bagasse storage building, water tank, stack, parts warehouse, office building, and electric shop are not fifty years old, and do not appear to meet the National Register's Criteria Consideration G for exceptional importance for properties less than 50 years old; therefore they are not considered to be historic properties.

As the proposed project will only directly involve the water tank and bagasse storage building, both of which were constructed by McBryde in the 1970s, the proposed project will have no direct effect upon historic properties. Retaining and reusing the water tank and bagasse storage building, will allow the sugar mill complex to remain intact. However, the reuse of these two components may have an indirect effect on the historic buildings and structures that comprise the sugar mill complex by introducing a new function as well as new visual and atmospheric elements to the complex, thereby reducing its integrity with regards to setting, feeling, and associations.

To mitigate any indirect effects, the client should consider providing the State Historic Preservation Division with additional digital photographs documenting the water tank and bagasse storage building, and to also provide the office with a copy of the original drawings of the bagasse storage building's conveyor system, which are presently held by Grove Farm Plantation.

Bibliography

Alexander, Arthur C., *Koloa Plantation, 1835-1935*, Lihue, Kauai: Kauai Historical Society, 1985.

Cook, Chris, *Kauai, The Garden Island, A Pictorial History*, Virginia Beach, Virginia: The Donney Company, 1999.

Donohugh, Donald, *The Story of Koloa*, Honolulu: Mutual Publishing Company, 2001.

Durrance, William, *Sugar Islands*, Honolulu: Honolulu: Mutual Publishing Company, 2000.

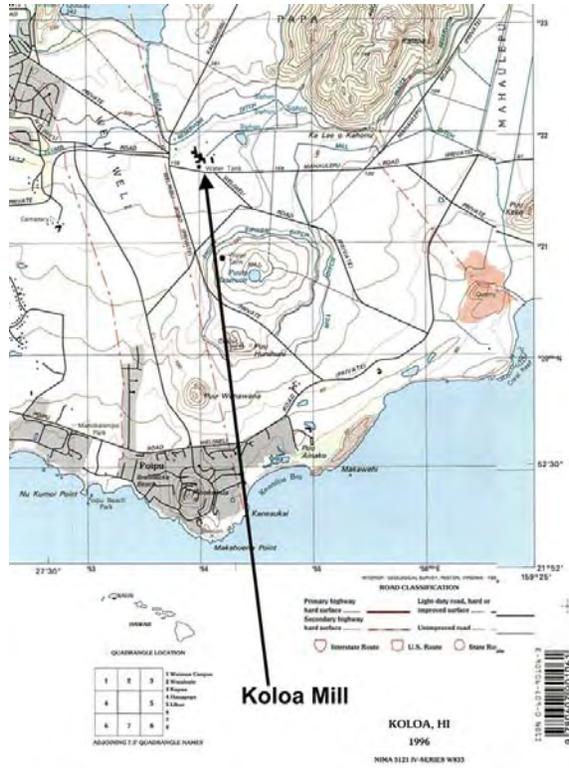
The Garden Island
"New Mill Started," June 10, 1913, page 1.

Gilmore's Hawaii Sugar Annual, 1936, 1938-39, 1947-48, 1951, and 1966.

Hoverson, Martha, *Historic Koloa: A Guide*, Koloa, Kauai: Friends of the Koloa Community, 1985.

Krauss, Bob with W. P. Alexander, *Grove Farm Plantation*, Palo Alto, California: Pacific Books, 1965.

Koloa Mill
 USGS Map
 Koloa Quadrangle, 1996
 1:24,000
 NAD 1983



Koloa Mill
 Photograph of Mill from the west, circa 1914-1924



Koloa Mill
Photograph of Mill from the west, 1948



Koloa Mill
Photograph of Mill from the southeast, 1958



Site # _____
TMK 2-9-001:001

___ Garage ___ Servants' or Guest House _____ Other

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Mill Building
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: ___ Public Private
6. Present Use: vacant Original Use: agricultural
Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
Style utilitarian
Primary Exterior Building Material: ___ Stone ___ Stucco ___ Adobe metal Other
Wood: ___ Clapboard ___ Shiplap ___ Vertical Board ___ Board and Batten
___ Shingle ___ Other
Additional Materials _____
Roof: Gable ___ Hipped _____ Other monitors Special features
Roofing Material metal
Roof Trim: ___ Closed Eaves Overhanging Eaves ___ Brackets
Dormers: ___ Gabled ___ Hipped ___ Shed ___ Eyelid ___ Other
Porch: ___ Inset ___ Outset ___ Open ___ Enclosed ___ Facade length
___ Wraparound ___ Centered ___ Offset
Door: ___ Centered ___ Offset ___ Inset ___ Transom ___ Side Panels
___ Sidelights ___ Window ___ Openings in walls at various locations ___ Other
Windows: ___ Double-Hung ___ Sliding ___ Casement ___ Awning ___ Jalousies
___ Plate glass ___ pivot ___ Other
Number of panes: _____
Other Features: most all of the machinery and equipment remain in the mill
8. Approximate Property Size: Frontage _____ Depth _____
or approximate acreage _____
9. Is the feature ___ Altered Unaltered ?
10. Surroundings: ___ Open Land ___ Scattered Buildings ___ Densely Built-up
___ Residential ___ Commercial Industrial _____ Other
11. Is the structure on its original site ___ moved ___ unknown
12. Year of initial construction 1913 This date is factual ___ estimated.
13. Architect (if known) _____
14. Builder (if known) John Grisholm
15. Related features: ___ Barn ___ Carriage House ___ Outhouse ___ Shed(s)
___ Formal Garden(s) ___ Windmill ___ Watertower/ Tankhouse

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

The mill building at Koloa was initially constructed in 1913. Over time numerous additions were made to the structure to accommodate expanded needs and improved technologies and equipment. The building is comprised of a number of gable roofed sections, with each section housing distinct functions.

When viewing the building from the west the dominant four story, front facing gable roofed section which forms a backdrop for most of the building, houses the boiler house, with the shed roofed power house extending off to the north. To the south of the boiler house is another four story, gable roofed section which contains the original boiling house. To the west of the original boiling house are a number of two and three story wings and additions with lateral and front facing gable roofs which accommodated the expansion of the boiling house and also a power plant. The prominent shed roofed addition and row of evaporators along the outside of the building on the west side were constructed by McBryde. The front facing gabled structure immediately to the north of the McBryde additions held a power house constructed in 1936, while the shallow pitched front facing monitor roofed wing to the north of the power house contains the mill train and machine shop. To the left rear of this wing is the original front facing, gable roofed bagasse storage area.

Within the building much of the machinery and equipment remains intact. The cleaning plant and crusher no longer remain on site; however, the twelve roller mill train and its concluding French Press are in place. The steam turbines that powered the mill train were removed and sold to Gay & Robinson for installation in their mill at Makaweli. The reduction gears remain. The machine shop still contains its crane, lathes and several other items. The two boilers are still intact as is their stack and the power house with its two General Electric steam turbines and generators. The latter was constructed in 1964 by Grove Farm and replaced the earlier power house located on the evaporator floor. The two boilers were also installed by Grove Farm. The smaller one was added in 1953 and replaced seven old boilers. The larger, second boiler was erected in 1964 in part to provide sufficient steam for the new power house.

The boiling house is four stories high. It still contains its clarifier, scales, heaters, quadruple effect evaporators, with numbers one and two in parallel, four mud presses, high and low grade pans and their Nash vacuum pumps, crystallizers, massecuite heaters, and low and high grade centrifugals. The cup elevator is also intact as are the conveyors leading to it. The ground floor of the boiling house is criss-crossed with overhead pipes to convey the sugar juice, massecuite, steam, and condensed water to various destinations, and contains numerous pumps. In addition one heater is located on this level, as is two large caustic soda tanks, and the base of the clarifier. Also at this level, in the southwest corner, are the centrifugals, which are elevated above the floor on

metal stagings. These include a row of four continuous low grade centrifugals, one of which was sent to HCS at Puunene on Maui. The initial Silver centrifugal is among this group and dates from circa 1966. Running perpendicular to the continuous centrifugals is a row of nine low grade batch centrifugals, six of which have been removed. Adjoining these machines, on its own staging are four high grade centrifugals, two of which were sold and sent to Louisiana. Screw conveyors are located beneath the centrifugals. These transported the sugar crystals to the cup elevator, which in turn took the processed sugar to a conveyor which led to the sugar bins.

On the evaporator floor may be found the scales, as well as the Dorr clarifier, and Oliver mud presses. The smallest of the four mud presses was brought to the mill by McBryde from Eleeele. Accompanying the mud presses are two receiver tanks and a cyclone feeder which delivered bagasse for the mud presses. The mud presses sit in their own shed roofed section. To the west of the mud presses, clarifier and scales are the five evaporators. K-1 and K-2 are in parallel, with the former built by Hilo Iron Works in 1936 and the latter by the St. Mary Iron Works in Louisiana. Beyond the evaporators is the 1936 two-story powerhouse wing, which is currently vacant with its 500 k.w. General Electric turbo-generator removed, although some of its control panels remain in place. The wing contains some of the few pivot windows in the mill. These have twenty four panes with a four pane pivot flanked by twelve panes above, six below and one to each side.

The third floor of the boiling house contains twenty three continuous system crystallizers. These were installed between 1951 and 1966. Steps lead up to a mezzanine which allows serving of the crystallizers from above.

The top floor of the boiling house is the pan floor. At the east end of this room are the three high grade pans, with pans 1 and 2 manufactured in Louisiana by St. Mary's Iron Works, and pan 3 made by Honolulu Iron Works in 1956. To the south of these are rectangular syrup tanks and a fourth high grade pan. To the west of the high grade pans are five low grade pans, which include two pans manufactured by Honolulu Iron Works, one dating from 1924 and the other 1936. Low grade pan number 8 is in a shed roofed addition which McBryde constructed. This pan was also fabricated by Honolulu Iron Works. The Nash vacuum pumps and condensers, which were installed in 1966, are all still intact on this floor, and at the east end two massecuite heaters.

An office and laboratory is also within the confines of the mill building in the southeast corner, and a lime station is located beyond the laboratory to the south in a shed roofed addition.

See the historic context section of the inventory report for information on the history and operation of the mill.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Site visit to the property on May 21-22, 2009 by Don Hibbard.

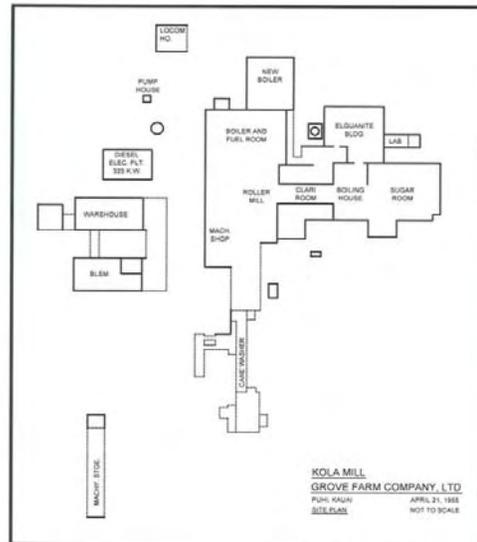
Gilmore's Hawaii Sugar Annual, 1936, 1938-39, 1947-48, 1951, and 1966.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Mill Building
Floor Plan from 1955



Koloa Sugar Mill: Mill Building
Overall view from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Exterior view from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Exterior view from the south, bagasse storage building on the right, 1949 sugar storage building on the left.
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Exterior view from the east
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Exterior view from the northeast, power house wing
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of mill train from the northwest
Photographer: Don Hibbard
May 22, 2009



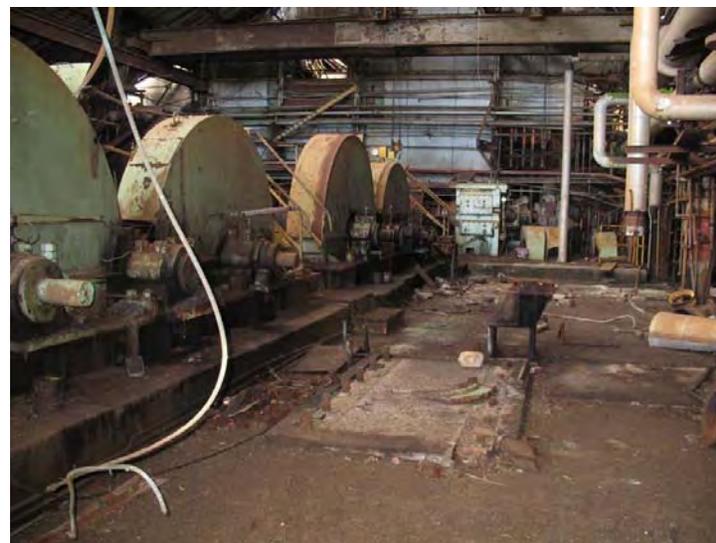
Koloa Sugar Mill: Mill Building
Interior view of mill train from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of French Press from the northwest
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of reduction gears, steam turbines have been removed, from the southwest
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of machine shop from the southwest, original bagasse storage area
behind rear concrete block wall.
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of original bagasse storage area from the east
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of power house, second floor with General Electric steam turbine and generator from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of condenser on ground floor of power house, from the south
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of scales, on evaporator floor of boiling house with mud press in background, from the southeast
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of heaters, on evaporator floor of boiling house from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of top of evaporator from crystallizer mezzanine from the southeast
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of old power house from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of old powerhouse from the east
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of crystallizers from the east
Photographer: Don Hibbard
May 22, 2009

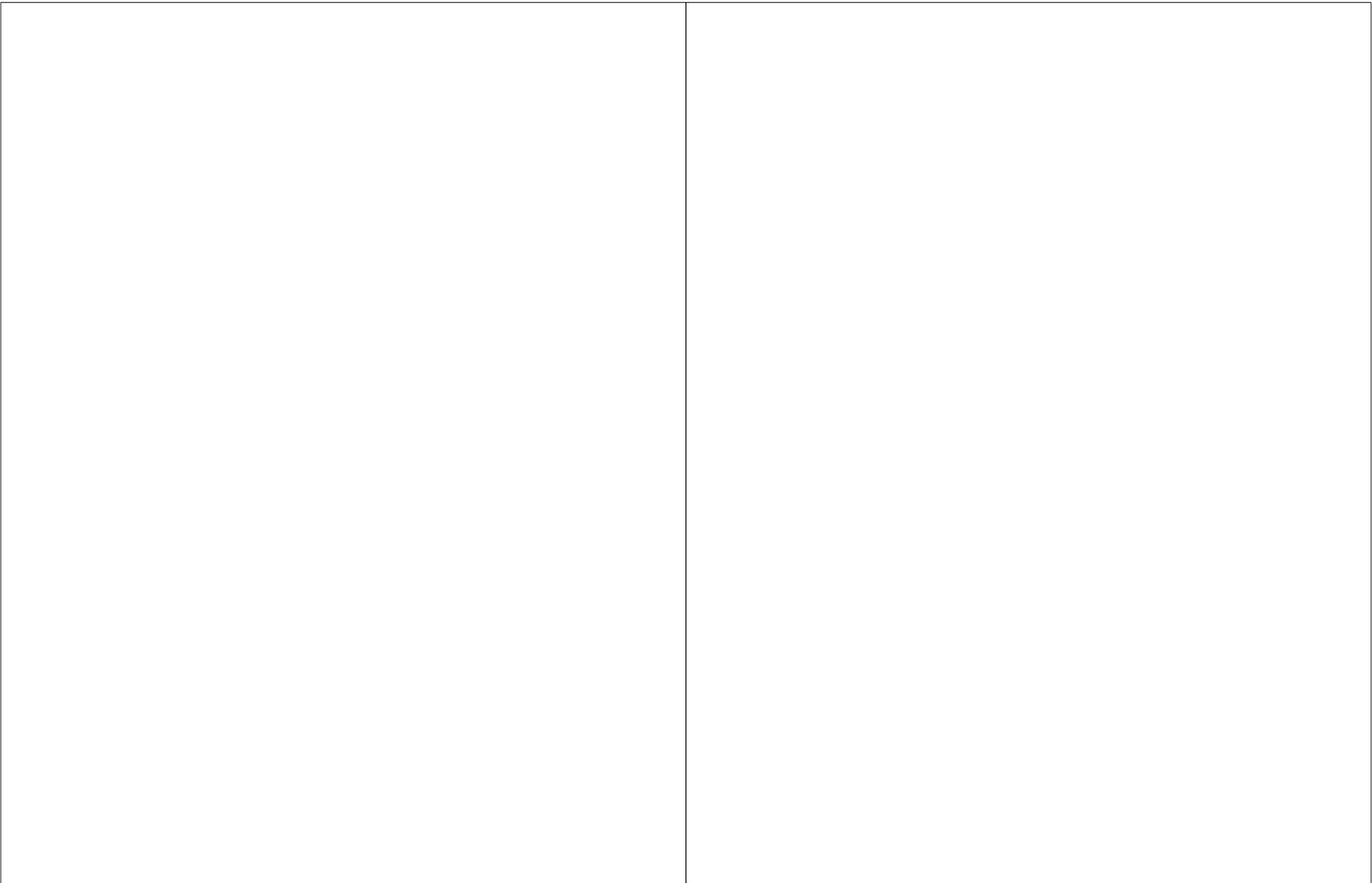


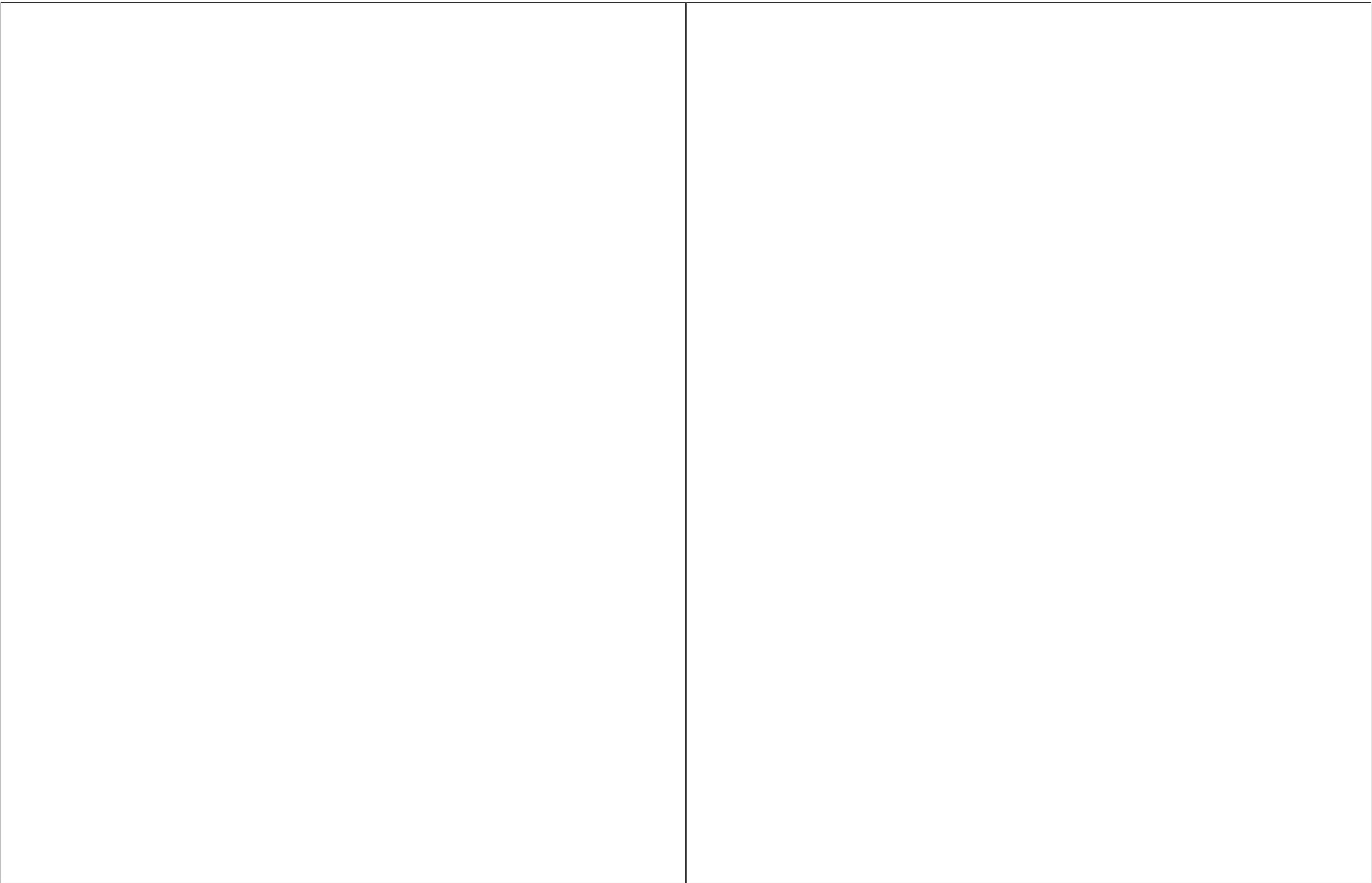
Koloa Sugar Mill: Mill Building
Interior view of mud presses on evaporator floor from the north
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of pan floor from the west, Honolulu Iron Works low grade pan dating from 1924 in immediate foreground.
Photographer: Don Hibbard
May 22, 2009







Koloa Sugar Mill: Mill Building
Interior view of pan floor from the northwest, High Grade Pan 4 in Foreground,
Syrup Tanks Beyond.
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of pan floor from the east, low grade pans
Photographer: Don Hibbard
May 22, 2009



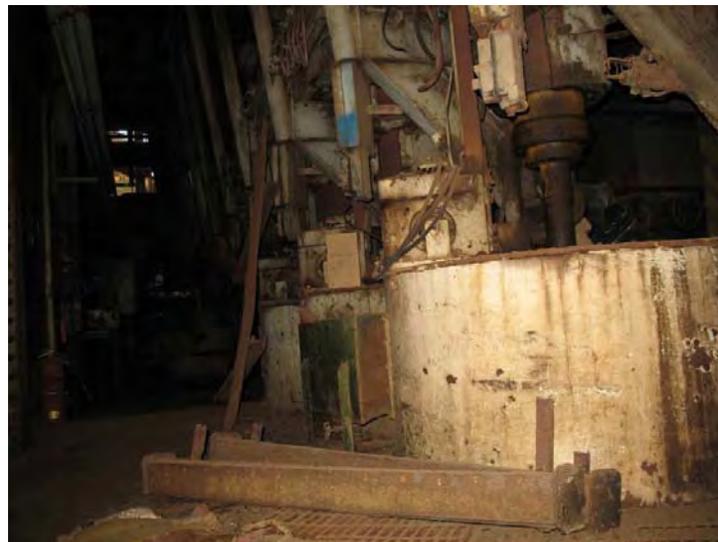
Koloa Sugar Mill: Mill Building
Interior view of massecuite heater on pan floor from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of low grade centrifugals, Silver in the foreground from the north
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of high grade centrifugals from the east
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of cup elevator and screw conveyor from the southeast
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
Interior view of boiler number one from the northeast
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Mill Building
 Interior view of lime station from the west
 Photographer: Don Hibbard
 May 22, 2009



Site # _____
 TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Bagasse Storage Building
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
 City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
 Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: vacant Original Use: agricultural
 Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
 Style utilitarian
 Primary Exterior Building Material: Stone Stucco Adobe concrete and metal Other _____
 Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other _____
 Additional Materials _____
 Roof: Gable Hipped _____ Other _____ Special features _____
 Roofing Material metal
 Roof Trim: Closed Eaves Overhanging Eaves _____ Brackets _____
 Dormers: Gabled Hipped Shed Eyelid Other _____
 Porch: Inset Outset Open Enclosed Facade length _____
 Wraparound Centered Offset _____
 Door: Centered Offset Inset Transom Side Panels _____
 Sidelights Window _____ Other _____
 Windows: Double-Hung Sliding Casement Awning Jalousies _____
 Plate glass _____ Other _____
 Number of panes: _____
 Other Features: bagasse conveyor system
8. Approximate Property Size: Frontage _____ Depth _____
 or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial _____ Other _____
11. Is the structure on its original site moved unknown
12. Year of initial construction 1975 This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

___ Garage ___ Servants' or Guest House _____ Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

McBryde Sugar Company obtained a lease on the former Koloa Sugar Mill in 1974. In the following year they constructed this bagasse storage building.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

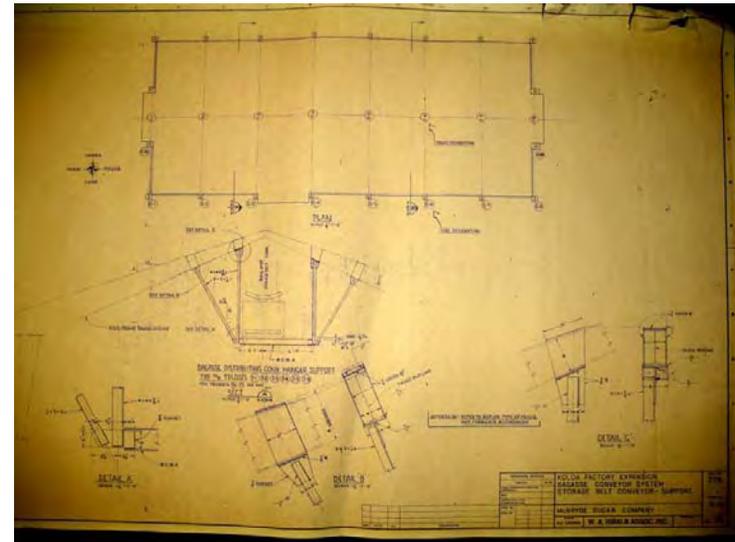
Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Bagasse Storage Building Bagasse Storage Building, Floor Plan



Koloa Sugar Mill: Bagasse Storage Building
View from the south
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Bagasse Storage Building
View from the southwest
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Bagasse Storage Building
Interior, view from the south
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Bagasse Storage Building
Conveyor from Bagasse Storage Building to Mill, View from the southeast
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Bagasse Storage Building
Bagasse Storage Building and blue covered conveyor to mill, View from the east
Photographer: Don Hibbard
May 22, 2009



Site # _____
 TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Warehouse Building
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
 City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
 Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: warehouse Original Use: agricultural
 Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
 Style utilitarian
 Primary Exterior Building Material: Stone Stucco Adobe metal Other
 Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
 Additional Materials _____
 Roof: Gable Hipped _____ Other _____ Special features _____
 Roofing Material metal
 Roof Trim: Closed Eaves Overhanging Eaves Brackets
 Dormers: Gabled Hipped Shed Eyelid Other
 Porch: Inset Outset Open Enclosed Facade length
 Wraparound Centered Offset
 Door: Centered Offset Inset Transom Side Panels
 Sidelights Window entire sidewall is comprised of open bays Other
 Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass Other
 Number of panes: _____
 Other Features: _____
8. Approximate Property Size: Frontage _____ Depth _____
 or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial Other
11. Is the structure on its original site moved unknown
12. Year of initial construction post-1974 This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

___ Garage ___ Servants' or Guest House _____ Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

McBryde Sugar Company obtained a lease on the former Koloa Sugar Mill in 1974. It subsequently constructed this warehouse building, which was used for the storage of spare parts. The present occupants of the building added the concrete floor.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Oral interview on May 21, 2009 with Bob Bryan, a former McBryde employee who currently works for the present occupant of the building,

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Spare Parts Warehouse
View from the southeast
Photographer: Don Hibbard
May 22, 2009



Site # _____
TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Fire Protection Pump Houses
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: vacant-recreation Original Use: agricultural
Other Past Uses: warehouse

DESCRIPTION

7. Physical Appearance:
- Style utilitarian
- Primary Exterior Building Material: Stone Stucco Adobe metal Other
Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
- Additional Materials _____
- Roof: Gable Hipped Other _____ Special features _____
Roofing Material metal
Roof Trim: Closed Eaves Overhanging Eaves Brackets
- Dormers: Gabled Hipped Shed Eyelid Other
- Porch: Inset Outset Open Enclosed Facade length _____
 Wraparound Centered Offset
- Door: Centered Offset Inset Transom Side Panels
 Sidelights Window Other
- Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass Other
Number of panes: _____
- Other Features: _____

8. Approximate Property Size: Frontage _____ Depth _____
or approximate acreage _____

9. Is the feature Altered Unaltered ?

10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial Other

11. Is the structure on its original site moved unknown

12. Year of initial construction unknown This date is factual estimated.

13. Architect (if known) _____

14. Builder (if known) _____

15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

Garage Servants' or Guest House Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

These two corrugated metal sheds housed the pumps used for the mill's fire protection system.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Fire Protection Pump Houses
 View from the south
 Photographer: Don Hibbard
 May 22, 2009



Site # _____
 TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Office, Warehouse and Electric Shop Building
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
 City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
 Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: agricultural Original Use: agricultural
 Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
 Style utilitarian
 Primary Exterior Building Material: Stone Stucco Adobe metal Other
 Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
 Additional Materials _____
 Roof: Gable Hipped _____ Other _____ Special features _____
 Roofing Material metal
 Roof Trim: Closed Eaves Overhanging Eaves Brackets
 Dormers: Gabled Hipped Shed Eyelid Other
 Porch: Inset Outset Open Enclosed Facade length
 Wraparound Centered Offset
 Door: Centered Offset Inset Transom Side Panels
 Sidelights Window _____ Other _____
 Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass Other _____
 Number of panes: _____
 Other Features: _____
8. Approximate Property Size: Frontage _____ Depth _____
 or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial _____ Other _____
11. Is the structure on its original site moved unknown
12. Year of initial construction post-1974 _____ This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

___ Garage ___ Servants' or Guest House _____ Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

McBryde Sugar Company obtained a lease on the former Koloa Sugar Mill in 1974. It subsequently constructed these two buildings to serve as their office, and as a warehouse and electrical shop. The buildings are presently occupied by Pioneer HI-Bred International, which uses it in their seed production operations.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Office, Warehouse, Electrical Shop
View from the northwest
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Office, Warehouse, Electrical Shop
 View from the west
 Photographer: Don Hibbard
 May 22, 2009



Site # _____
 TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Sugar Bins
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
 City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
 Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: vacant Original Use: agricultural
 Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
 Style utilitarian
 Primary Exterior Building Material: Stone Stucco Adobe metal Other
 Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
 Additional Materials _____
 Roof: Gable Hipped _____ Other Shed _____ Special features _____
 Roofing Material metal
 Roof Trim: Closed Eaves Overhanging Eaves _____ Brackets
 Dormers: Gabled Hipped Shed Eyelid Other
 Porch: Inset Outset Open Enclosed Facade length
 Wraparound Centered Offset
 Door: Centered Offset Inset Transom Side Panels
 Sidelights Window _____ Other _____
 Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass _____ Other _____
 Number of panes: _____
 Other Features: _____
8. Approximate Property Size: Frontage _____ Depth _____
 or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial _____ Other _____
11. Is the structure on its original site moved unknown
12. Year of initial construction _____ 1950 _____ This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

___ Garage ___ Servants' or Guest House _____ Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

Gilmore's Hawaii Sugar Manual for 1951 reported Grove Farm had installed a new sugar bin of three hundred ton capacity. The sugar bin was constructed when Grove Farm decided to shift from shipping its sugar in bags to bulk shipping. The two bins have three chutes to load the sugar into the trucks for transportation to the ships.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Gilmore Hawaii Sugar Manual, 1951

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Sugar Bins
View from the southeast
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Sugar Bins
View from the west
Photographer: Don Hibbard
May 22, 2009



Site # _____
TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Sugar Storage Building
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: vacant-recreation Original Use: agricultural
Other Past Uses: warehouse

DESCRIPTION

7. Physical Appearance:
Style round
Primary Exterior Building Material: Stone Stucco Adobe metal Other
Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
Additional Materials
Roof: Gable Hipped Other conical Special features
Roofing Material metal
Roof Trim: Closed Eaves Overhanging Eaves Brackets
Dormers: Gabled Hipped Shed Eyelid Other
Porch: Inset Outset Open Enclosed Facade length
 Wraparound Centered Offset
Door: Centered Offset Inset Transom Side Panels
 Sidelights Window Other
Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass Other
Number of panes: _____
Other Features: _____
8. Approximate Property Size: Frontage _____ Depth _____
or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial Other
11. Is the structure on its original site moved unknown
12. Year of initial construction 1949 This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

___ Garage ___ Servants' or Guest House _____ Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

This building was constructed in response to the I.L.W.U. (International Longshoremen and Warehousemen's Union) shipping strike of 1949. The strike was a part of the union's intensive campaign against the Big Five companies in Hawaii and virtually stopped all shipments to and from Hawai'i. Concerned that their sugar could not be delivered to the mainland, and fearful that their crops would rot in the fields if not harvested, the plantations on Kauai decided to remain in operation, harvest their crops, process the cane, and jointly store the sugar until such time that it could be shipped to California for refining. In addition to this store house, McBryde built a similar one, and also made available a warehouse for sugar storage. The shipping strike lasted for 177 days, and this building at Koloa was never used to store sugar as McBryde's facilities were able to handle all the plantations' storage needs. The building was subsequently used for storage. In recent years Grove Farm has generated some revenues from this distinctive structure by renting it out for large parties.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Oral interview on May 21, 2009 with Bob Bryan, a former McBryde employee who currently works on the premises adjoining the Koloa Sugar Mill.

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Sugar Storehouse
View from the west
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Sugar Storehouse
 Interior, View from the west
 Photographer: Don Hibbard
 May 22, 2009



Site # _____
 TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Water Storage Tank
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
 City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
 Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: vacant Original Use: agricultural
 Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
 Style round
 Primary Exterior Building Material: Stone Stucco Adobe metal Other
 Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
 Additional Materials
 Roof: Gable Hipped Other flat Special features
 Roofing Material metal
 Roof Trim: Closed Eaves Overhanging Eaves Brackets
 Dormers: Gabled Hipped Shed Eyelid Other
 Porch: Inset Outset Open Enclosed Facade length
 Wraparound Centered Offset
 Door: Centered Offset Inset Transom Side Panels
 Sidelights Window Other
 Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass Other
 Number of panes: _____
 Other Features: _____
8. Approximate Property Size: Frontage _____ Depth _____
 or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial Other
11. Is the structure on its original site moved unknown
12. Year of initial construction 1975 This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

___ Garage ___ Servants' or Guest House _____ Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

McBryde Sugar Company obtained a lease on the former Koloa Sugar Mill in 1974. It constructed this water tank in 1975 as part of its fire protection system.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Oral interview on May 21 2009 with Bob Bryan, a former McBryde employee, who presently works on the premises adjoining the Koloa Mill..

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Water Tank
View from the east
Photographer: Don Hibbard
May 22, 2009



Site # _____
TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

- 1. Common Name: Koloa Sugar Mill: Molasses Storage and Dav Tanks
- 2. Historic Name, if known: _____
- 3. Street or rural address Weliweli Road
City: Koloa Zip: 96756 County: Kauai
- 4. Present Owner, if known: Grove Farm
Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
- 5. Ownership is: Public Private
- 6. Present Use: vacant Original Use: agricultural
Other Past Uses: _____

DESCRIPTION

- 7. Physical Appearance:
Style round
Primary Exterior Building Material: Stone Stucco Adobe metal Other
Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
Additional Materials _____
Roof: Gable Hipped Other flat Special features _____
Roofing Material metal
Roof Trim: Closed Eaves Overhanging Eaves Brackets
Dormers: Gabled Hipped Shed Eyelid Other
Porch: Inset Outset Open Enclosed Facade length _____
 Wraparound Centered Offset
Door: Centered Offset Inset Transom Side Panels
 Sidelights Window Other
Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass Other
Number of panes: _____
Other Features: _____

8. Approximate Property Size: Frontage _____ Depth _____
or approximate acreage _____

9. Is the feature Altered Unaltered ?

10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial Other

11. Is the structure on its original site moved unknown

12. Year of initial construction pre-1935 This date is factual estimated.

13. Architect (if known) _____

14. Builder (if known) _____

15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

Garage Servants' or Guest House Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

Up through 1951 Koloa Mill had limited molasses storage with its only tank holding 66 tons for waste molasses (Gilmore, volumes published between 1935 and 1951). Grove Farm expanded this capacity sometime between 1951 and 1966, with Gilmore's Hawaii Sugar Manual for 1966 reporting that Grove Farm had four vertical tanks, 10' x 40' with a total capacity of 100,000 gallons of molasses. There is no evidence of any 10' x 40' tanks on the premises, so it appears these tanks date from the pre-1935 period.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Molasses and Tanks
View from the west, with sugar bins in the left background and sugar storage building in the right background.
Photographer: Don Hibbard
May 22, 2009



Site # _____
 TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Foundations of CaneCleaning Station
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
 City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
 Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: vacant Original Use: agricultural
 Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
 - Style Utilitarian
 - Primary Exterior Building Material: Stone Stucco Adobe concrete Other
 - Wood: Clapboard Shiplap Vertical Board Board and Batten Shingle Other
 - Additional Materials _____
 - Roof: Gable Hipped _____ Other _____ Special features _____
 - Roofing Material _____
 - Roof Trim: Closed Eaves Overhanging Eaves _____ Brackets
 - Dormers: Gabled Hipped Shed Eyelid Other
 - Porch: Inset Outset Open Enclosed Facade length Wraparound Centered Offset
 - Door: Centered Offset Inset Transom Side Panels Sidelights Window _____ Other
 - Windows: Double-Hung Sliding Casement Awning Jalousies Plate glass _____ Other
 - Number of panes: _____
 - Other Features: _____
8. Approximate Property Size: Frontage _____ Depth _____
 or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial _____ Other
11. Is the structure on its original site moved unknown
12. Year of initial construction late 1930s, 1956, post-1974 This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)

___ Formal Garden(s) ___ Windmill ___ Watertower/ Tankhouse
___ Garage ___ Servants' or Guest House ___ Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

The harvesting of cane began to be mechanized in Hawaii during the 1930s. The Koloa Sugar Company's fields, however, were so rocky, that the company continued to harvest by hand up to the time of its merging with Grove Farm. Koloa Sugar Company had a modest cane cleaning plant where the trains dropped off the cane to be processed by the mill, but it was not until after Grove Farm acquired Koloa's fields and mill that a concerted effort was made to remove the rocks from the fields and to institute mechanized harvesting. In addition, Grove Farm introduced trucks to transport the cane from the fields to the mill, eliminating the plantation railway.

The concrete foundation is all that remains of the enlarged cleaning plant Grove Farm constructed in 1957. The company used the rocks separated by the cleaning operation to make roads, and they took the mud and cane trash to build up new acres of productive land for growing cane, eventually improving one hundred and thirty acres of barren and unproductive lava flow into cane fields. McBryde further expanded the mill's cleaning capabilities after it acquired a lease on the mill in 1974. They added the final concrete portion of the cleaning plant. The trucks would drive up to the wall at the far end of the structure and the cane would be dumped into the bin on the other side, and would then be processed

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Krauss, Bob, with W. P. Alexander, *Grove Farm Plantation*, Palo Alto, California: Pacific Books, 1965.

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Foundation of the Cane Cleaning Plant
Looking out from the mill, view from the east
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Foundation of the Cane Cleaning Plant
View from the south
Photographer: Don Hibbard
May 22, 2009



Koloa Sugar Mill: Foundation of the Cane Cleaning Plant
McBryde addition, view from the south
Photographer: Don Hibbard
May 22, 2009



Site # _____
TMK 2-9-001:001

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Koloa Sugar Mill: Stack
2. Historic Name, if known: _____
3. Street or rural address Weliweli Road
City: Koloa Zip: 96756 County: Kauai
4. Present Owner, if known: Grove Farm
Address if different from above: 3-1850 Kaunualii Hwy, Lihue 96766
5. Ownership is: Public Private
6. Present Use: warehouse Original Use: agricultural
Other Past Uses: _____

DESCRIPTION

7. Physical Appearance:
Style utilitarian
Primary Exterior Building Material: Stone Stucco Adobe metal Other
Wood: Clapboard Shiplap Vertical Board Board and Batten
 Shingle Other
Additional Materials _____
Roof: Gable Hipped Other _____ Special features _____
Roofing Material NA
Roof Trim: Closed Eaves Overhanging Eaves Brackets
Dormers: Gabled Hipped Shed Eyelid Other
Porch: Inset Outset Open Enclosed Facade length
 Wraparound Centered Offset
Door: Centered Offset Inset Transom Side Panels
 Sidelights Window Other _____
Windows: Double-Hung Sliding Casement Awning Jalousies
 Plate glass Other _____
Number of panes: _____
Other Features: _____
8. Approximate Property Size: Frontage _____ Depth _____
or approximate acreage _____
9. Is the feature Altered Unaltered ?
10. Surroundings: Open Land Scattered Buildings Densely Built-up
 Residential Commercial Industrial Other _____
11. Is the structure on its original site moved unknown
12. Year of initial construction 1983 This date is factual estimated.
13. Architect (if known) _____
14. Builder (if known) _____
15. Related features: Barn Carriage House Outhouse Shed(s)
 Formal Garden(s) Windmill Watertower/ Tankhouse

Garage Servants' or Guest House Other

16. Date of attached photograph May 22, 2009

See attached sheets

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site when known):

McBryde Sugar Company obtained a lease on the former Koloa Sugar Mill in 1974. It constructed this stack with its internal scrubber system in 1983. The stack was designed to reduce the particulate matter in the smoke emerging from the stack. It replaced two earlier stacks and an external scrubber system which had been built by Grove Farm.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

Oral interview on May 22, 2009 with Earl Smith, who formerly worked with McBryde.

Site visit to the property on May 21-22, 2009 by Don Hibbard.

CREDITS

Date form prepared June 1, 2009 By (name): Don Hibbard
Address: 119 Merchant Street, Suite 501 City: Honolulu Zip: 96813
Phone: (808)-536-0556 Organization: Mason Architects

STATE USE ONLY:

Koloa Sugar Mill: Stack
View from the east
Photographer: Don Hibbard
May 22, 2009



Appendix F

*Cultural Impact Assessment for the proposed Koloa-Poipu
Regional Wastewater Reclamation Facility and Collection
System, Koloa, Weliweli, and Paa Ahupuaa, Koloa District,
Island of Kauai*

Cultural Surveys Hawaii, Inc.

May 2009

Cultural Impact Assessment
for the proposed Kōloa-Po'ipū Regional Wastewater
Reclamation Facility and Collection System,
Kōloa, Weliweli, and Pā'ā Ahupua'a, Kōloa District,
Island of Kaua'i

TMK: [4] 2-8-004: por. 003; [4] 2-8-008: por. 001 & por. 036; [4] 2-8-009: por. 001; [4] 2-8-011: por. 001; [4] 2-8-014: por. 005, por. 019, por. 023, por. 030, & por. 037; [4] 2-8-022: por. 001, por. 011, por. 021, & por. 030; [4] 2-9-001: por. 001

Prepared for
Wilson Okamoto Corporation

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Management Summary

Reference	Cultural Impact Assessment for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System, Kōloa, Weliweli, and Pā'ā Ahupua'a, Kōloa District, Island of Kaua'i (Spearing & Hammatt 2009)
Date	May 2009
Project Number (s)	Cultural Surveys Hawai'i Inc. (CSH) Job Code: KOLOA 29
Land Jurisdiction	The project area is predominantly situated in private lands owned by Grove Farm and the E.A Knudsen Trust, with smaller parcels belonging to various private land owners or the County of Kaua'i.
Agencies	State of Hawai'i Department of Land and Natural Resources / State Historic Preservation Division (DLNR / SHPD)
Project Description	<p>HOH Utilities, LLC proposes to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region on the south shore of the Island of Kaua'i. The proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility (Regional WRF) and collection system (hereinafter collectively referred to as the "project area") is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.</p> <p>The proposed wastewater collection system improvements would consist of four (4) wastewater pump stations (Kōloa WWPS, Villages WWPS, Crater WWPS, and Eastern WWPS) along with gravity lines and force mains situated within existing undeveloped lands, roadways or along established utility line corridors or unpaved roadway corridors within a predominantly agricultural area.</p> <p>Associated ground disturbance will include excavation related to the project area's development, to include: structural footings, utility installation, as well as roadway and parking area installation.</p>
Project Location	<p>The project area is located on the south shore of the Island of Kaua'i in the Kōloa District. The new Regional WRF will be situated within an agricultural area utilizing a portion of the existing Kōloa Mill site. This site is located at the eastern end of Weliweli Road in Kōloa Town, and consists of Tax Map Key (TMK): [4] 2-09-001: portions of 001 and 002.</p> <p>The wastewater collection system serving the new Regional WRF is planned to consist of three (3) components: 1.) The Kōloa Collection System, 2.) The Po'ipū Collection System, and 3.) The Eastern Collection System.</p>

	<p>New sewer lines associated with the Kōloa Collection System would be routed within both privately-owned property and the rights-of-way for portions of County roadways which are Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road. Privately-owned properties affected include parcels associated with Tax Map Keys (TMKs): 2-08-004: portion of 003, 2-08-008: portion of 001 and 036 (Yamada Road), 2-08-009: portion of 001, and 2-08-011: portion of 001, 2-08-014: portion of 023, and 2-08-022: portion of 001. A new wastewater pump station (Kōloa WWPS) would also be provided near the intersection of Waikomo Road with Weliweli Road, identified as TMK 2-08-011: portion of 001.</p> <p>The Po'ipū Collection System will involve the construction of two (2) new wastewater pump stations. The Villages WWPS is proposed to be located within an undeveloped site just <i>mauka</i> of the existing Kīahuna Swim and Tennis Club facility and east of Hapa Road within a parcel identified as TMK: (4) 2-08-014: portion of 019. The Crater WWPS is proposed to be located within an undeveloped site east of the existing water tanks near Pu'uhi Reservoir within a parcel identified as TMK: (4) 2-09-001: portion of 001.</p> <p>The Eastern Collection System will involve the construction of one (1) new wastewater pump station. The Eastern WWPS is proposed to be located within an undeveloped site located east of the Po'ipū Bay Golf Course and <i>mauka</i> of the private road that extends eastward from Po'ipū Road within a parcel identified as TMK: (4) 2-09-001: portion of 001.</p> <p>Sewer lines associated with the Po'ipū and Eastern Collection Systems would predominantly be located within privately owned property and a few County roadways. These properties are identified as TMKs: (4) 2-08-014: portions of 005 (Kīahuna Plantation Drive), 019, 030, and 037; (4) 2-08-022: portions of 011, 021, and 030; (4) 2-09-001: portion of 001.</p> <p>The entire project area is depicted on the 1996 Kōloa U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.</p>
Project Acreage	The proposed Regional WRF and 4 wastewater pump stations total an approximate area of 10 acres. The project also includes an approximately 5-mile long and 10 ft wide corridor, proposed for the installation of gravity lines and force mains.
Land Jurisdiction	The project area is predominantly situated in private lands owned by Grove Farm and the E.A Knudsen Trust, with smaller parcels belonging to various private land owners or the County of Kaua'i.

Area of Potential Effect (APE)	For the purposes of this CIA, the APE is defined as the approximately 10-acre project area plus the 5-mile long and 10 ft wide corridor footprint within the larger context of Kōloa, Weliweli and Pā'ā Ahupua'a.
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. CSH undertook this CIA at the request of Wilson Okamoto Corporation. Through document research and cultural consultation efforts, this report provides information pertinent to the assessment of the proposed project's impacts to cultural practices (per the Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts). This 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-42 and Hawai'i Administrative Rules Chapter 13-284.
Community Consultation	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. The organizations consulted included the State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs (OHA), the Kaua'i-Ni'ihau Islands Burial Council (KNIBC), the Kaua'i Historic Preservation Review Commission (KHPRC), Mālama Māhā'ulepū, the Kōloa Neighborhood Center and community and cultural organizations in the Kōloa area.
Results of Background Research	<p>Background research for this project yielded the following results:</p> <ol style="list-style-type: none"> 1. From previous archaeological studies and historic accounts it appears that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. As an extensive irrigated complex, the Kōloa Field System was used to divert the waters of the Waikomo Stream for taro, native sugar, and fish. 2. In the early post-contact era (1795-1880), the Kōloa Field System continued in use for foreign trade and was probably further intensified. Sweet potatoes were a main crop for the whaling and merchant ships, and the purchase of pigs, salt, oranges and other items are noted in many ship journals. 3. Documents of the Great Māhele show that by the mid-1800s there were still several traditional farmers within Kōloa who both lived and worked within the area. The individual claims – for both <i>lo'i</i> (wetland) and <i>kula</i> (dryland) suggest that while traditional farming of taro for subsistence was still taking place, in <i>kula</i> lands – sugar cane production for sale to the

	<p>nearby sugar mill, had begun to dominate the landscape. Of the LCAs within Kōloa, several claim a <i>kula</i> planted with cane or a cane field or sugar cane garden. Several also identify cane lands as boundaries for the LCAs.</p> <ol style="list-style-type: none"> 4. Within three years of sugar cultivation by Ladd and Company in 1835, residents in and surrounding Kōloa were quickly moving to adapt to the new economy based on the production of sugar cane. Eventually, most of inland Kōloa was planted with sugar cane and only the rockiest areas, unsuitable for cultivation, survived the dramatic changes in the landscape brought about during the early 20th century. A 1935 map of Koloa Sugar Company shows the extensive cane lands within the project area (see Figure 8). 5. The Koloa Sugar Company had previously purchased the <i>ahupua'a</i> of Pā'ā southeast of Kōloa town. A new mill was built in Pā'ā in 1912 about a mile from Kōloa Town, and in the immediate vicinity of the proposed Regional WRF (see Figure 10). The mill in Pā'ā was finally closed in 1996. 6. By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline. Although the town had established a Civic Center in 1977, the pace of tourism-driven development at the shoreline drew construction and service jobs away from the town center. 7. Based on background research, historic properties (i.e. archaeological sites) in the form of pre- and post-contact surface architecture may be encountered during the archaeological inventory survey of the project area. Historic research has indicated five LCAs in the vicinity of the project area, suggesting indigenous Hawaiian land use in the form of habitation and agriculture. Previous archaeological research has documented evidence of both pre- and post contact land use in the area. 8. Evidence of indigenous Hawaiian land use could include both habitation (platforms, enclosures, and C-shapes) and agricultural (terraces, mounds, field walls, etc.) features. Evidence of post-contact land use is likely to be associated with historic sugarcane cultivation and could include irrigation infrastructure (ditches and flumes), sugar transport infrastructure (road causeways, railroad berms, etc.), clearing mounds, and boundary walls.. 9. It should be noted that due to the extensive sugarcane cultivation documented within the project area, mechanized
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	<p>land modifications associated with sugarcane cultivation has likely disturbed and/or destroyed any pre-contact historic properties that may have been present. Additionally the project area is situated primarily within in-use roadways and old cane haul roads, which have caused additional land modifications within the project area, disturbing and/or destroying historic properties. Thus the probability of encountering surface historic properties during the pedestrian inspection is low.</p>
<p>Results of Community Consultation</p>	<p>CSH attempted to contact 52 community members (government agency or community organization representatives, or individuals such as cultural practitioners) for the purposes of this CIA, 31 people responded. One provided a short testimony and ten <i>kūpuna</i> (elders) and/or <i>kama'āina</i> (native-born) were interviewed for more in-depth contributions to the CIA. Two interviews are currently pending approval and were not included in this report.</p> <p>Community consultation shows:</p> <ol style="list-style-type: none"> 1. According to community contacts, the site of the Kōloa-Po'ipū Wastewater Reclamation Facility and Collection System and vicinity is likely to have surface and subsurface cultural and historic properties, including human skeletal remains. Several of the study participants are concerned about <i>iwi kūpuna</i> (ancestral remains) and cultural and historic properties in or near the project area. <ol style="list-style-type: none"> a. Clyde Nāmu'ō of OHA states, "Numerous cultural sites including, but not limited to heiau complexes and fishing shrines are situated within the assessment area and community groups are actively working to preserve these cultural sites for future generations." b. Stella Burgess says that it is likely that <i>iwi kūpuna</i> will be found in Kukui'ula and Kōloa, which is full of underground lava tubes. She recommends that if any cultural historic properties, such as <i>iwi kūpuna</i> are found, the construction should stop. She hopes that the project proponent will be sensitive toward cultural issues and the project will keep "above board" and if anything is found, it should be reported. She recommends for a special place to be designated for the <i>iwi kūpuna</i> and they should be put back as quickly as possible not to create another Wal-Mart situation (in which cultural and lineal descendants as well as members of the community expressed outrage over the treatment of the 25 sets of human remains found during construction.) She would like to be contacted if any <i>iwi</i>

	<p><i>kūpuna</i> or other cultural historic properties are found.</p> <ol style="list-style-type: none"> c. Mr. Francis Ching, archaeologist and former Kaua'i resident states that because most of the project area is on sugar cane lands that were previously harrowed, it is most likely that very few sites will be found. However, if burials are found, they will be easily identified by looking at the stones closely. The walls in burials are nicely lined up. If they aren't, they are probably sweet potato mounds. He recommends that a cultural monitor be present during construction. d. Kōloa Resident #2 says that there are additional significant cultural resources that have not been adequately documented and assessed by prior historic-preservation work. She says that to her knowledge no one has surveyed the underground caves. She says that many of the burial sites between Kōloa and Po'ipū, where current projects are being built, were not recorded. e. Mr. Randy Wichman voiced his concerns with the proposed project in the <i>mauka</i> regions of Po'ipū saying, the project proponent, "will actually be taking out some of the sites, although originally designated to be taken out or data recovery, we lose those [sites]." He is concerned the project proponent will breach the railroad berm. He also mentioned that "within the actual footprint of the Hapa Road area there may be some real sensitive issues because there are a lot of things going on right now, like the law suit." He recommends a higher level of sensitivity be used in the Hapa Road area. Although the project will be near the edge of Hapa Road, he asks the area be looked at as part of the whole scheme and seen as such." He is also concerned with the "affect the project may have on the Kāne I Olo Uma site because it had that serious agriculture component." f. Mr. Rupert Rowe is also concerned for the safety of the Kāne I Olo Uma site on the edge of the project area. <p>2. The project area and environs, has a long history of use by Kānaka Maoli (native born), and other <i>kama'āina</i> groups for a variety of cultural activities including fishing, the gathering of plants and fruits like mountain apple (<i>Syzygium malaccense</i>), java "choke plum" (<i>Syzygium cuminii</i>) and 'ilima (<i>Sida</i>). Community participants expressed concern that <i>mauka</i> access is restricted as a result of past development and that access to</p>
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	<p>cultural and natural resources has been disrupted. Two project participants shared their concerns about the limited access of Waitā Reservoir, which is impeding cultural practices. One participant mentions ongoing gathering of plants in the project area.</p> <ol style="list-style-type: none"> a. Beryl Blaich says, "Since the plantation closed, the community has lost access to Waita Reservoir where there are now commercial operations, as well as to the cane haul road along the mill, which the community traditionally used to go to Māhā'ulepū, and to the valleys and ridges where pigs were hunted and people did gather plants." She continues by saying that although landowners and leasees are concerned about liability, vandalism and already commit money to management of the area, community members resent their exclusion to formerly used areas. b. Kōloa Resident #1 recalls fishing in Waitā Reservoir as a child and thinks that access should be granted to the public. He says that the children of today should be able to go fishing at Waitā. c. Stella Burgess mentioned flowers are often gathered in the project area, specifically 'ilima from the Pu'uwanawana area to the former cane fields. <p>3. One community member also is concerned with the wild pigs from the <i>mauka</i> regions making their way to the coastal area. Beryl Blaich states that these wild pigs have created a problem in the native plant restoration project of Grove Farm leasees David and Linda Burney. She continues mentioning that she is unsure if the pigs are also a problem for the GMO corn operation starting in Pā'ā and Māhā'ulepū.</p> <p>4. One cultural consultant is concerned with the project's impacts to view corridors. Beryl Blaich expresses Mālama Māhā'ulepū's concerns with the visual and environmental impacts to Pu'u Wanawana, Pu'u Hunihuni and Pu'uhi Reservoir. "We are concerned about the visual impact of the proposed eastern pump station and the crater pump station on these puu, especially looking mauka from the coast to the mill."</p> <p>5. One project participant is concerned with the historic preservation of the Kōloa Sugar Mill. Beryl Blaich says, "The mill itself is a historic icon. From the Makawehi and Punahoa limestone headlands on the coast, the mill presents a distinctive profile yet does not obscure the singular coastal craters. Ideally,</p>
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	<p>the mill will not be demolished but reused and no future structure near it will obscure or dominate it.”</p> <ol style="list-style-type: none"> 6. Beryl Blaich also expresses concern about possible environmental impacts on two of the craters. After the winter rainy season, they hold intermittent lakes that are frequented by migratory water birds. She is concerned that the wastewater plant will cause the birds of the area to become endangered. 7. Mr. Randy Wichman expressed his concerns with the cost of the project saying, “The massive drilling through bedrock. If they actually commit to the directional drilling, my guess it is going to be really expensive. It is probably easier for them to just carve a trench through than it is to drill. So cost wise it will be a lot more expensive.” 8. Several community members express a desire for a preservation or development plan for the area. <ol style="list-style-type: none"> a. Beryl Blaich recommends for the Kōloa-Po‘ipu-Kalāheo development plan to be updated. She states that there “is a need for [a] master plan for this important area as well as for the development plan [to] update Koloa’s undeveloped lands.” b. Mr. Rupert Rowe states, there is “no plan for preservation” and that Kaua‘i is, “the only county with no evacuation plan or signs.” 9. Several community members recommended the project proponent discuss the project with the community or look to the past to solve planning problems. <ol style="list-style-type: none"> a. Stella Burgess recommends the developers ask for help when dealing with cultural issues. She advises the project proponents to consult with the community in general and in particular with Grace Bacle, whose family comes from the South Shore. b. Kōloa Resident #1 recommends the project proponent hold public meetings and update the community on the proposed project. Project participant c. Mr. Randy Wichman mentioned the importance of place names and their association with the history of Kōloa. He also mentions it is important that the exact footprint is for public view where this pump station is going to be. d. Community member Ms. Wilma Holi stated project planners need to go back into the history of Kōloa and
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	<p>Po‘ipū to understand how was the community designed.</p> <ol style="list-style-type: none"> 10. Two community members voiced concerns or recommendations regarding water resources in the project area. <ol style="list-style-type: none"> a. Mr. Randy Wichman stated, “Part of the reclamation of the water since it is good for irrigation could be considered for ‘auwai use. It might be worth considering as a concession in this particular area that it would be done.” b. Aunt Wilma Holi Aunt Wilma Holi voiced concerns about the lack of water and the source of water for this project. She also stated concern for the many dry streams and river beds and that there is a new reservoir but no water in stream. She also recommended recycling the waste to be used for soil. c. Mr. Tommy Oi voiced the benefits of the project saying the proposed project, “would be a better way to contain all your sewage and waste. Most waste will be contained. I know that they can recycle the water. A lot of that water can be used by the community and for irrigation. It is just something that is going to help the area so I don’t have any concerns.” 11. Three participants are concerned with the smell and noise that may be generated from the Pump Stations. <ol style="list-style-type: none"> a. Kōloa Resident #1 is most concerned with the smell the Kōloa Pump Station will generate. The Kōloa Pump Station is very close to his home. b. Kōloa Resident #2 hopes that there will be no odor or noise from the facility at the Mill. c. Aunt Wilma Holi is concerned with, “The smell of waste is everywhere.” 12. One participant recommends that the project proponent take responsibility for cleaning the area near the old Kōloa Mill. Kōloa Resident #2 is suggests the project proponent clean the area by removing abandon cars and other garbage in the area, and making the area more presentable, instead of just being a “brownfield.” 13. Two project participants voiced concern that they would be forced to hook up to the new sewage system which would be expensive. They are also concerned the project will lay the pipes through their backyards and property.
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	<p>a. Kōloa Resident #1 believes the project is unnecessary and will probably not hook up to the system. He stated that many of the Kōloa community members he knows are satisfied with the current cesspool system they have and also will not hook up. He believes this project will benefit upcoming businesses and the Kōloa Creekside subdivision, not the existing community members.</p> <p>b. Kōloa Resident #2's family is also concerned about the cost of hooking up to the sewage system. They explained that many community members had recently renovated their cesspools after Hurricane 'Iniki . They also do not want project pipes in their backyards and properties.</p> <p>14. Three participants expressed sadness, frustration, or negative feelings about the overall cumulative impacts of ongoing and future developments in Kōloa-Po'ipū as contributing to the loss of what is authentic and traditional about the area:</p> <p>a. Kōloa Resident #1 sees this project as "opening the door to more development" in the Kōloa-Po'ipū area</p> <p>b. Kōloa Resident #2 is concerned about the project's long-term impacts on the community. She stated that new infrastructure (sewer system, new water system, etc) may mean that a significant zoning change or large development project is anticipated and thus, foresees this project supporting more (new) development in the future. Her family expressed frustration with the ongoing development of the Kōloa-Po'ipū area. Kukui'ula has especially brought out a lot of negative sentiments from the community.</p> <p>c. Mr. Rupert Rowe states that, "the traditional cultural practices are affected by population growth in the project area: All the fishing in this area is not the way it once was before we could fill a couple coolers. Shoreline everything has changed. More people, the environment has changed and thus changed our culture."</p>
<p>Recommendations</p>	<p>Several participants expressed concern that the proposed action for the Kōloa, Weliweli and Pā'ā <i>ahupua'a</i> may negatively impact Hawaiian and Kōloa community members' beliefs, resources and practices. A good faith effort to develop appropriate measures to address concerns and pay attention to the following recommendations may help mitigate potentially adverse effects of the proposed project on cultural, historic</p>

	<p>and natural resources in and near the project area. Based on the findings of this CIA, it is recommended that:</p> <ol style="list-style-type: none"> 1. Based on the archival evidence and community consultation conducted for this assessment, it is possible that there are human skeletal remains as well as significant cultural and historic properties in the project area; it is therefore recommended that: <ol style="list-style-type: none"> a. Cultural monitoring and continuous ongoing consultation with cultural and lineal descendants of the area be conducted during all phases of development including ground-breaking and construction; b. Personnel involved in development activities be informed of the possibility of inadvertent cultural finds, including human remains. Should cultural or burial sites be identified during ground disturbance, all work should immediately cease, and the appropriate agencies notified pursuant to applicable law; c. If human burials are found, cultural and lineal descendants of the area should be consulted with regard to burial treatment plans. 2. Generally, it is recommended that project proponents pursue proactive consultation with community members in the Kōloa area in order to address community concerns about the impacts to the environment, access to Waitā Reservoir, view corridors, possible cultural finds and sites, etc., integrate preservation and restoration ideas into the design and construction of the annex before development begins, and to consider meaningful ways of benefiting/contributing to the local Kōloa community.
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Section 1 Introduction

1.1 Project Background

At the request of Wilson Okamoto Corporation, Cultural Surveys Hawaii, Inc. (CSH) conducted a Cultural Impact Assessment (CIA) for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System project, located in the *ahupua'a* of Kōloa, Weliweli, and Pā'ā, Kōloa District, Island of Kaua'i.

HOH Utilities, LLC proposes to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region on the south shore of the Island of Kaua'i. The proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility (Regional WRF) and collection system (hereinafter collectively referred to as the "project area") is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.

The proposed wastewater collection system improvements would consist of four (4) wastewater pump stations (Kōloa WWPS, Villages WWPS, Crater WWPS, and Eastern WWPS) along with gravity lines and force mains situated within existing undeveloped lands, roadways or along established utility line corridors or unpaved roadway corridors within a predominantly agricultural area.

Associated ground disturbance for the proposed project will include excavation related to the project area's development, to include: structural footings, utility installation, as well as roadway and parking area installation.

The project area is located on the south shore of the Island of Kaua'i in the Kōloa District. The new Regional WRF will be situated within an agricultural area utilizing a portion of the existing Kōloa Mill site. This site is located at the eastern end of Weliweli Road in Kōloa Town, and consists of Tax Map Key (TMK): [4] 2-09-001: portions of 001 and 002.

The wastewater collection system serving the new Regional WRF is planned to consist of three (3) components: 1.) The Kōloa Collection System, 2.) The Po'ipū Collection System, and 3.) The Eastern Collection System.

New sewer lines associated with the Kōloa Collection System would be routed within both privately-owned property and the rights-of-way for portions of County roadways which are Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road. Privately-owned properties affected include parcels associated with Tax Map Keys (TMKs): 2-08-004: portion of 003, 2-08-008: portion of 001 and 036 (Yamada Road), 2-08-009: portion of 001, and 2-08-011: portion of 001, 2-08-014: portion of 023, and 2-08-022: portion of 001. A new wastewater pump station (Kōloa WWPS) would also be provided near the intersection of Waikomo Road with Weliweli Road, identified as TMK 2-08-011: portion of 001.

The Po'ipū Collection System will involve the construction of two (2) new wastewater pump stations. The Villages WWPS is proposed to be located within an undeveloped site just *mauka* of the existing Kīahuna Swim and Tennis Club facility and east of Hapa Road within a parcel identified as TMK: (4) 2-08-014: portion of 019. The Crater WWPS is proposed to be located

within an undeveloped site east of the existing water tanks near Pu'uhi Reservoir within a parcel identified as TMK: (4) 2-09-001: portion of 001.

The Eastern Collection System will involve the construction of one (1) new wastewater pump station. The Eastern WWPS is proposed to be located within an undeveloped site located east of the Po'ipū Bay Golf Course and mauka of the private road that extends eastward from Po'ipū Road within a parcel identified as TMK: (4) 2-09-001: portion of 001.

Sewer lines associated with the Po'ipū and Eastern Collection Systems would predominantly be located within privately owned property and a few County roadways. These properties are identified as TMKs: (4) 2-08-014: portions of 005 (Kīahuna Plantation Drive), 019, 030, and 037; (4) 2-08-022: portions of 011, 021, and 030; (4) 2-09-001: portion of 001.

The entire project area is depicted on the 1996 Kōloa U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle and a composite of Tax Map Keys (TMK) [4] 2-8 and [4] 2-9 (Figure 1 & Figure 2)

The proposed Regional WRF and four wastewater pump stations total an approximate area of ten acres. The project also includes an approximately 5-mile long and ten foot wide corridor, proposed for the installation of gravity lines and force mains. The project area is predominantly situated in private lands owned by Grove Farm and the E.A Knudsen Trust, with smaller parcels belonging to various landowners'.

1.2 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. Through document research and cultural consultation efforts, this report provides information pertinent to the assessment of the proposed project's impacts to cultural practices and resources (per the OEQC's Guidelines for Assessing Cultural Impacts). 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-42 and Hawai'i Administrative Rules Chapter 13-284.

1.3 Companion Archaeological Inventory Survey of the Project Area

An Archaeological Inventory Survey (AIS) was conducted by CSH for the project area. The results of the archaeological study are presented in a companion report titled, "Archaeological Inventory Survey for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System, Kōloa, Weliweli, and Pā'ā Ahupua'a, Kōloa District, Island of Kaua'i" (Tulchin & Hammatt 2009). Results of the AIS are enumerated in Section 5 below.

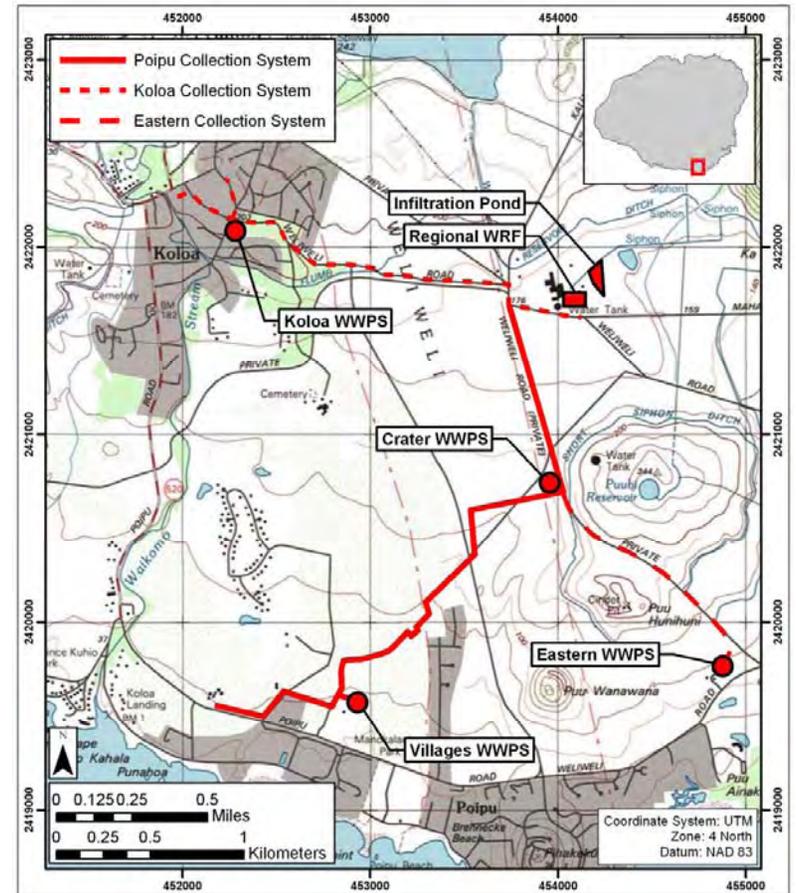


Figure 1. USGS 7.5 Minute Series Topographic Map, Kōloa Quadrangle (1996), showing the location of the project area

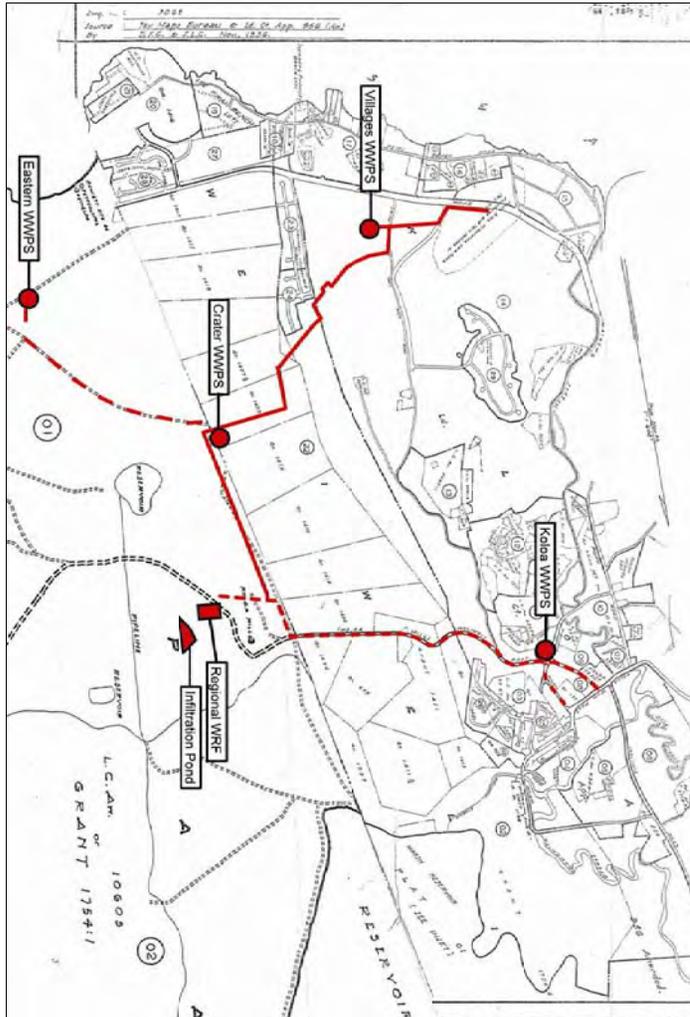


Figure 2. Composite of Tax Map Key [4] 2-8 (top half) and [4] 2-9 (bottom half) showing project area location

Cultural Impact Assessment for the Proposed Kōloa-Po'ipū Regional WRF & Collection System

TMK: [4] 2-8-004; [4] 2-8-008; [4] 2-8-009; [4] 2-8-011; [4] 2-8-014; [4] 2-8-022; [4] 2-9-001

1.4 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. A 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 traditional cultural practices at or near the parcel; present uses of the parcel; and/or other (non-Hawaiian) practices, uses, or traditions associated with the parcel.
4. Preparation of a report summarizing the results of these research activities.

1.5 Environmental Setting

1.5.1 Natural Environment

The project area ranges from approximately 10 meters (m) (32 ft.) to 3 km (1.9 mi.) north of the coast, and ranges from approximately 317 m (0.2 miles) to 3.2 km (2 miles) east of Waikomo Stream.

The project area receives 40 to 91 inches (1000 to 1500 millimeters) of rainfall per year, falling mostly in the winter months (November through March) (Giambelluca et al. 1986:86). Temperatures range from highs around 90°F to maximum lows of about 50°F, with the greatest variations occurring between day and night rather than winter and summer.

Observed vegetation within the project area consisted of cacti (*Cactaceae*), *koa haole* (*Leucaena leucocephala*), buffelgrass (*Pennisetum ciliare*), and java plum (*Syzygium cumini*).

Lands within the project area are relatively level with elevations ranging from 15 to 200 ft above mean sea level (AMSL). According to U.S. Department of Agriculture (USDA) soil survey data the sediments within the project area consist primarily of Waikomo clay (Wt & Ws) and Koloa clay (KvB & KvC), with a small pocket of Fill land (Fd) within the middle of the proposed Kōloa Collection System (Foote et al. 1972) (Figure 3). The Waikomo series consists of “well-drained, stony and rocky soils on uplands...developed in material weathered from basic igneous rock, probably with a mixture of ash and alluvium in places...used for sugarcane, pasture, wildlife habitat, and homesites” (Foote et al. 1972). The Koloa series consists of “well-drained soils on slopes of old volcanic vents and upland ridges on ... underlain by hard rock at a depth of 20 to 40 inches...developed in material weathered from basic igneous rock...used for irrigated sugarcane” (Foote et al. 1972). Fill land consists of “areas filled with material from

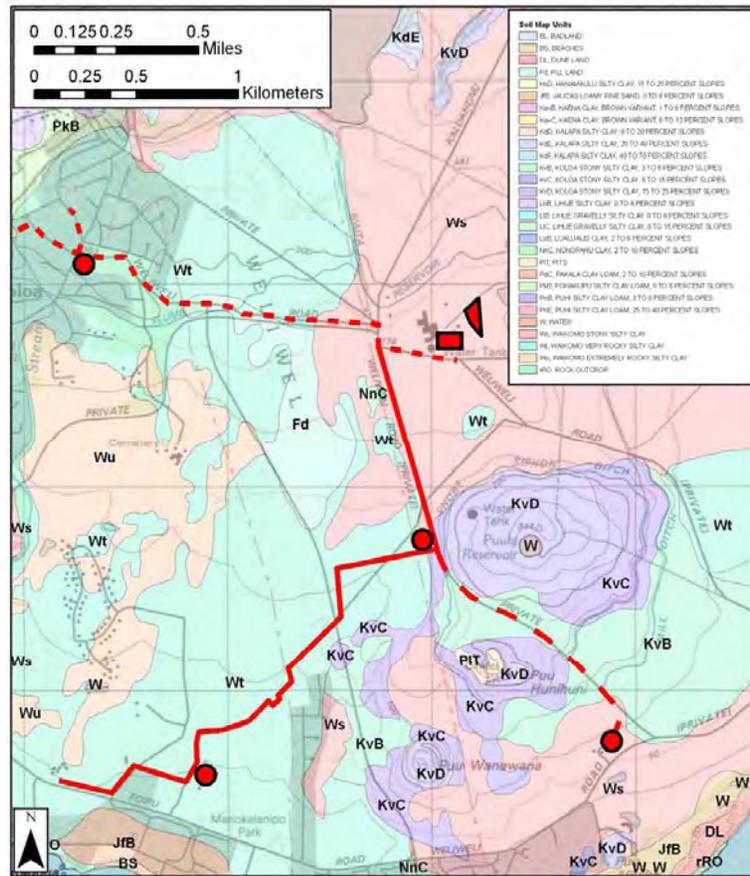


Figure 3. Overlay of Soil Survey of the State of Hawai'i (Foote et al. 1972), indicating sediment types within the project area (indicated in red)

dredging, excavation from adjacent uplands, garbage, and bagasse and slurry from sugar mills” (Foote et al. 1972).

1.5.2 Built Environment

Currently the proposed locations of the Regional WRF and wastewater pump station are all located either within undeveloped parcels, overgrown with exotic vegetation, or within agricultural fields formerly utilized for sugar cultivation. Additionally the proposed gravity lines and force mains run within existing asphalt paved roadways, cane haul roads, and/or railroad grade.

During the post-contact period a majority of the project area had been impacted by land modifications (grubbing, grading, etc.) associated with historic sugar cultivation. An orthophotograph of the area shows the outlines of fallow cane fields as well as former cane fields that are currently being utilized for diversified agriculture, within and in the vicinity of the project area (Figure 4).

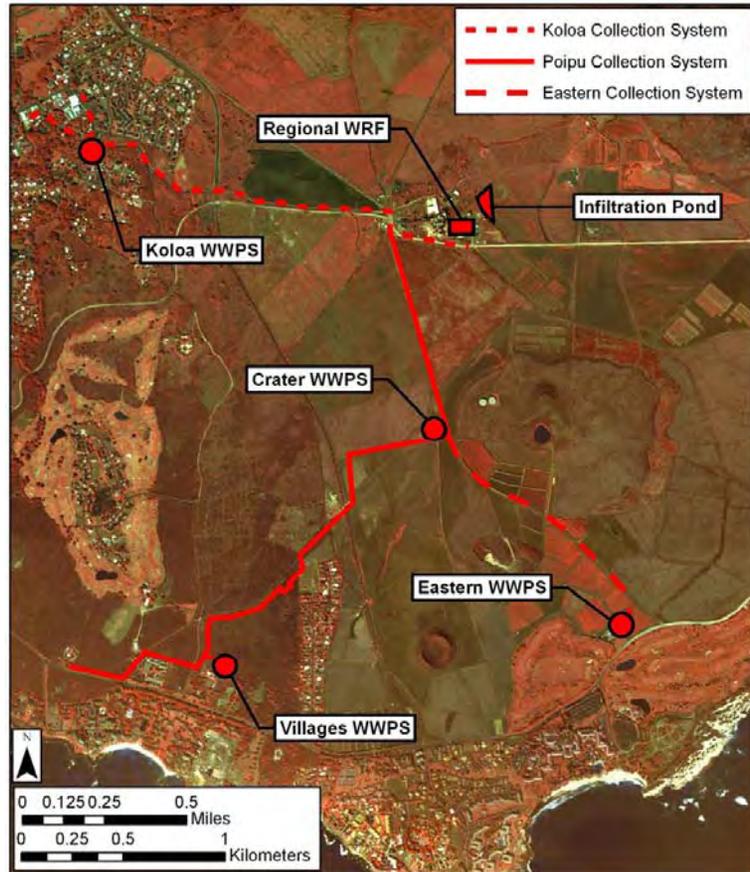


Figure 4. Orthophotograph showing historic and modern land disturbance within and in the vicinity of the project area (source: USDA Aerial Photograph Field Office 2000)

Section 2 Methods

Historical documents, maps and existing archaeological information pertaining to the sites in the vicinity of this project were researched at the CSH library. Information on Land Commission Awards was accessed through Waihona 'Āina Corporation's Māhele Data Base (www.waihona.com) as well as other online resources (e.g., <http://www.ulukau.org/cgi-bin/vicki?l=en>). The State Historic Preservation Division (SHPD), Office of Hawaiian Affairs (OHA), Kaua'i-Ni'ihau Islands Burial Council (KNIBC), Kaua'i Historic Preservation Review Commission (KHPRC), and community and cultural organizations in Kōloa were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project area and the surrounding vicinity. The names for potential community contacts were also provided by colleagues at CSH and from the authors' familiarity with people who live in the vicinity of the project area. The cultural specialist conducting research on this assessment employed snowball sampling methods, an informed consent process and semi-structured interviews according to standard ethnographic methods (as suggested by Bernard 2005). Some of the prospective community contacts were not available to be interviewed as part of this project. A discussion of the consultation process can be found in Section 6 on Community Consultations. Please refer to Table 5, Section 6 for a complete list of individuals and organizations contacted.

Section 3 Traditional Background

3.1 Overview

This section focuses on the traditional background of the *ahupua'a* of Kōloa, Weliweli and Pā'ā in general, and specifically on the inland/near-coastal portions of this *ahupua'a*. Kōloa, Weliweli and Pā'ā Ahupua'a are located in the *moku* (traditional district) of Kona (Figure 5). The subject project area is spread across these three *ahupua'a*.

3.2 Place Names

Translations presented without attribution in this subsection are from Pukui et al. (1974), unless indicated otherwise.

Kōloa, according to Pukui et. al (1974), is town, park, land division, elementary school, district reservoir, landing, and stream, southeast Kaua'i. According to one account, the district was named for a steep rock called Pali-o-kō-loa. The first successful sugar plantation in the Islands was started here in 1835. It became a part of Grove Farm in 1948. The name Kōloa itself has several derivations. Kōloa is the name for the large, soft Hawaiian sugar cane (*Saccharum officinarum*) once grown by the Hawaiians (Pukui et. al 1974: 116). According to William Kikuchi, Kōloa is also the name of a "steep rock on the banks of Waikomo Stream, from whence the *ahupua'a* got its name." This bank of the river was called Kōloa, after the native Hawaiian duck (*Anas wyvilliana*) (Kikuchi 1963:46; Pukui et al. 1974:116).

Weliweli, "fearful." Frederick Wichman says that when the island was being explored by the Menchune, who had been brought to Kaua'i by Kū'alunuipaukūmōkumoku, one adventuresome group was led by Weliweli, a gruff-voiced man. He was very strict and everyone jumped to fulfill his orders. The area was named after him (Wichman 1998:43-44).

Pā'ā Land section and cones, Kōloa district, Kaua'i. *Lit.*, dry, rocky. Frederick Wichman defines it as "fence of lava rock" (Wichman 1998:45).

Waitā Reservoir, Grove Farm, Kaua'i. Perhaps *wai-*, water, and *-ta* rice paddy (Japanese). Formerly called Kōloa.

Waikomo Stream, Kōloa district, Kaua'i. The sleeping forms of the gods Kāne and Kanaloa are said to be imprinted at Maulili pool in this stream (Pukui et. al (1974).

Waihohonu. Hill and stream, Kōloa district, Kaua'i. A "hole" here was formed when a *kupua* [one possessing supernatural powers] hero Palila, felled a forest of trees with a single stroke. *Lit.*, deep water.

Ka-uhu-'ula, "red parrotfish," is a ridge that descends from Kāhili peak onto the plains that mark the beginning of the Puna District (Wichman 1998: 39).

Ka-mo'o-loa, "long ridge," is at the bottom of Kauhū'ula and was the scene of many battles (Wichman 1998:39).

Kukui'ula, Land section, harbor and bay, Kō-loa district, gulch, and stream, Kīpahulu. *Lit.*, red light.

Ka-lae-o-ka-honu, "headland of the turtle" (Wichman 1998:45).

Māhā'ulepū, Land section and road, Kō-loa district, Kaua'i. *Lit.*, and falling together. "The boundary of Māhā'ulepū follows the Pā'ā border to Kuma'ulele peak and then continues along the ridge to the top of Hā'upu mountain, then goes down the western ridge named Lae-ka-weli-koa to the sea (Wichman 1998:46).

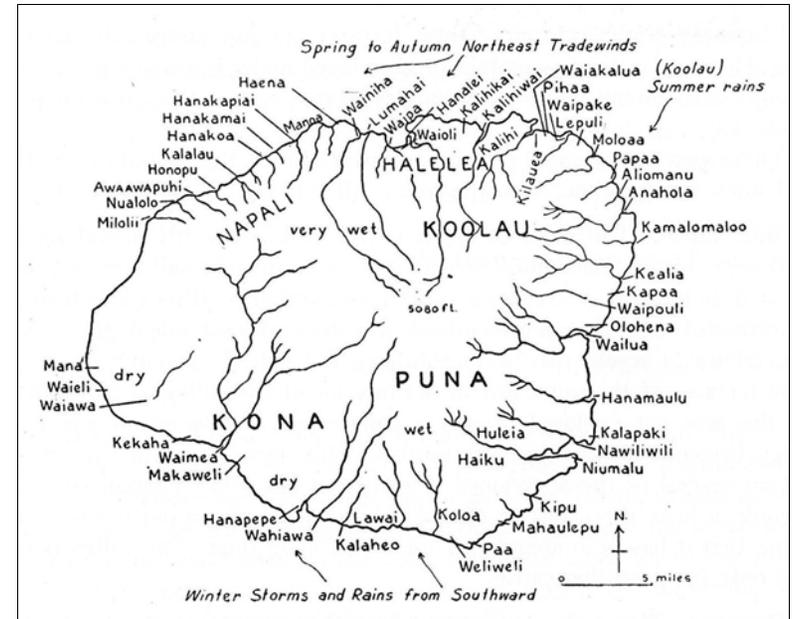


Figure 5. Moku (traditional districts) and *ahupua'a* of Kaua'i; the Kōloa, Weliweli and Pā'ā *ahupua'a* are within the Kōloa District (Handy 1940)

3.3 Mo'olelo (Stories) Associated with Specific Place Names

3.3.1 Kōloa Mo'olelo

There are several places within Kōloa that have legendary associations. The first is Maulili Pool, meaning "constant jealously," in Waikomo Stream, a sacred place once located in the present Kōloa Town, in the middle of the *ahupua'a*.

One tale is of the gods Kāne and Kanaloa who slept on the eastern bank of Maulili Pool and left the impressions of their forms on the *āpapa* (coral flat). “The apapa in this vicinity is called an ‘Unu.’ and a ‘Heiau,’ but was never walled in, it is said. [This heiau may be the Maulili Heiau described by Makea in section 3.5 below.] On the nights of Kāne the drums are heard to beat there, also at the sacred rocks, or *unu’s*, of Opuokahaku and Kānemilohaie, near the beach of Po‘ipū...” (Farley 1907:93). Just below the resting places of Kāne and Kanaloa is the “Pali o Kōloa” or “Cliff of Kōloa,” of which the district was possibly named after.

Wai-hānau meaning “birth pool,” is a rock on the eastern bank of the pool. There is a *mele* (chant) about Waihānau:

“Aloha wale ka Pali o Kōloa,

Ke Ala huli i Waihānau e, hānau” (Farley 1907:93).

Below Wai-hānau, was a rock shaped like a human tongue called “Ka-‘ōlelo-o-Hawai‘i, “language of Hawai‘i.” It is said that Kaweloleimakua, who lived at the end of the 1600’s, brought this rock to Kaua‘i from the island of Hawai‘i. According to Wichman (1988), “Kiha-wahine, the fearsome *mo‘o* goddess, lived in this pool. When she was in residence, the water turned red and no one dared to swim there” (Wichman 1998:40). “At the southern end of the Maulili pool waited two large ‘auwais [ditch, canal] that watered the land east and west of Kōloa” (Farley 1907:93).

Maulili is also the name of Kōloa’s most important *heiau*. It was first built by Ka-pueo-maka-walu, the son of Kapu-lau-ki. He had his house on the eastern side of this heiau. It was a place of human sacrifice, but once Kapueomakawalu died, it was no longer used its location was lost (Wichman 1998: 41). Many years later, when ‘Aikanaka had defeated his cousin Kawelo in the battle of stones on the plains of Wahiawa, ‘Aikanaka wanted a place to sacrifice the body. No one was sure of it, but a deaf mute led ‘Aikanaka to the place. The place was rebuilt and in the morning ‘Aikanaka went to sacrifice the body. He found that Kawelo was healed from his wounds and it was ‘Aikanaka instead who was sacrificed (Wichman 1998:41).

Kapueomakawalu also built the heiau of Louma, which stood on the mountain side of Ho‘oleina-ka-pua‘a, “place to throw in the pig.” This was beside a small pond *mauka* of Maulili. Louma was a small heiau in which hogs, red fishes, and other sacrifices were offered. It was dedicated to Lono-i-ka-ou-ali‘i, the god who had come to Kaua‘i with La‘a-mai-kahiki in the twelfth century. The stones for this *heiau* were brought from O‘ahu. It is said that the Menehune did the actual building (Wichman 1998:41).

According to Wichman (1998), Palila, the legendary figure who wielded a huge war club to save his father, was born during the period of war between the kingdoms of Puna and Kona about 1200 A.D. at Kamo‘olua. He was raised by his grandmother in the heiau of ‘Ālana-pō, “night offering,” sacred to the gods from the time of darkness (Wichman 1998: 39-40).

The following is a *mo‘olelo* about the small stream called Weoweo-pilau, “rotten bigeye fish” which is on the plains of Kamo‘olua:

It seems an upland farmer heard that the bigeye fish were running at the beach, so he went down and caught a great number of them. On his way home, an old woman asked him for a few fish but he refused to give her any, saying she could

go to the shore and get as many as she wanted. As he continued home, his load of fish became heavier and heavier, the path dustier and dustier, and the sun blazed with heat. When he reached the stream, he put down his fish and plunged in to cool off. When he came out, he smelled that his fish were completely rotten. He then realized that the old lady had been Pele, the volcano goddess, testing his generosity and hospitality. He had been found wanting and was punished (Wichman 1998:40).

The Kōloa *ahupua‘a* is “well watered by constantly flowing streams. Two of these, the ‘Ōma‘o, “green,” and Pō-‘ele‘ele, “dark night,” feed the area of Pūwai (a variety of wild duck). Where they join, the stream becomes Wai-komo, “entering water,” which flows down the center of the land, bringing life to the drier regions toward the seashore. It is so named because from time to time the stream disappears for a bit before reappearing farther down the slope” (Wichman 1998:40).

There are also many *mo‘olelo* in the *makai* (seaward) area of Kōloa. According to Wichman (1998), Hālau-a-ka-lena, “shed for the ‘olena (*Curcuma domestica*), turmeric plant,” was dedicated to the *mo‘o* goddess Kihawahine. If she was offended she would take the form of a sea dragon and patrol the seashore, killing all who dared fish from canoes and along the reef and rocks (Wichman 1998:420). The story of “Ke Kōloa o Kaikapū” is similar (Wichman and Fayé 1991: 88-91) in which a *mo‘o* named Kaikapū guarded the Kōloa shoreline, keeping everyone away from the swimming places and from the food on the reefs and in the sea. She would eat fishermen and swimmers near the shore. Soon no one living in Kōloa would come to the ocean to fish, gather the golden brown *lipoa* seaweed used to flavor their food, or work at the natural rock pans where salt was made. Liko and his grandmother lived on the hill above Kukui‘ula bay. Liko’s grandmother once expressed that she longed for the taste of *i‘a ho‘omelu*, the relish made of raw *hīnālea* (brightly colored wrasses, family *Labridae*) fish mixed with red salt, roasted *kukui* (*Aleurites moluccana*) nuts and brown *lipoa* seaweed. Liko decided his grandmother must have the fish and brought his *kauila* (*Alphitonia ponderosa*) wood spear and his *hīnālea* trap woven from *inalua* (*Cardiospermum halicacabum*) vine. Liko dove into the water and battled Kaikapū. He defeated her by swimming into the lava tube opening that led to a rocky platform above and trapping her in the narrowing tube. From then on, the seashore was free for everyone to use. Even today when the column of water shoots high into the sky, an angry roar echoes from the tube, ke kōloa o Kaikapū (Wichman and Fayé 1991: 88-91).

3.3.2 Weliweli Mo‘olelo

Weliweli’s east boundary begins at the headland Maka-hūena, “eyes overflowing with heat” (Wichman 1998: 44). Sometimes the headland shimmers in the summer sun, and whenever that happened it was believed that a procession of departed chiefs and their followers were on the move. It was safest to stay away until the shimmering stopped (Wichman 1998:44).

There are three *mo‘olelo* of how the swamp in the Weliweli *ahupua‘a* was formed:

At the upper end of this *ahupua‘a* was a swamp that now has been dammed to create a reservoir for the sugar plantation. At one time this area was covered by forest. Palila, son of Ka-lua-o-pā-lena, left the *heiau* where he had been raised and trained, curious about the noise of battle he heard. He climbed to the peak Kū-

manumanu, “scarred Kū,” and looked down on the battlefield. He saw his father’s army on one side and the Kona enemy led by Nā-maka-o-ka-lani on the other, seemingly ready for the usual face-to-face battle. However, Palilia noted that, unknown to his father, the enemy chief had concealed many of his warriors in the woods. Palila took his war club and with one sweep felled a tree at the edge of this forest. It fell against its neighbor with such force that the neighbor fell too, and one by one, all the trees in the forest toppled, crushing the enemy beneath them.

Then Palila rested his war club on the ground. It was so heavy that it sank deep into the ground. When Palila pulled out, a gush of water welled out. This spring, Wai-hohonu, “deep water,” covered the once mighty forest, creating the swamp of Palena, named after Palila’s father.

Wai-hohonu is sometimes given as Wai-o-honu, “stream of the turtle,” and the giant stone turtle on the ridge above is pointed out as being the turtle in question. A female turtle dug out a hole for a nest, but a never-ending gush of water greeted her. On her way to search for another nesting site, she was turned to stone.

Another explanation for the swamp tells of a maiden who lived at Palena, her house surrounded by a fence of ‘ōlena plants. Her lover used to come from his home down the coast by canoe and walk up to visit. He became irritated that she was never ready to receive him, there was no food prepared, the house was not neat, and so on. She retorted that since the forest obstructed her view and he never sent a messenger to announce his coming, there was no way she could anticipate his coming. The young man seized an ax and cut down all the trees, giving the young woman a clear view over the plains to the sea and plenty of time to have thing ready for his arrival (Wichman 1998: 44-45).

3.3.3 Pā’ā Mo’olelo

The following is a *mo’olelo* about the fishing god Kāne’aukai:

On the headland between Pā’ā and Weliweli stood a large *heiau*, Kāne-’aukai, “seafaring man.” Kāne-’aukai was the oldest brother of Maikoha, who at his death turned into the hairy wauke (paper mulberry). Four of his sisters were transformed into fishing grounds, each attracting a different species of fish. His body was in the shape of a log of wood that drifted ashore here and was carried in and out by the tide for several days. Tiring of this, Kāne’aukai change into his human form and came ashore. He came across two old men fishing. From time to time they would chant a prayer, but as the prayer was not directed to any god in particular it was caught in the wind and blown away. Kāne’aukai asked them why they did not pray to a particular fishing god; they replied that although they knew of a god who could help him, they did not know his name. Kāne’aukai replied: ‘His name is Kāne-’aukai, and when you let down your nets again call out, ‘*Eia ka’ai a me ka i’a, e Kāne’aukai,*’ ‘Here is the food and fish, Kane-’aukai,’ and he will help you.’ The old men followed his instructions, and each time they threw in their nets they drew up a great haul of fish. Other people heard of the old men’s great

success in fishing and came to learn the name of the fishing god, too.’ (Wichman 1998: 45-46)

Pā’ā was also famous for its *he’e* (octopus) which was especially large and delicious. This tale is about the chief Keakianoho:

[*He’e*] was the favorite food of Ke-akia-noho, the *konohiki* [headman of *ahupua’a* under the chief] who had become the local chief after Kaluaopālena, with the help of his son Palila, had conquered Nāmakaokalani of Kona, and he looked forward happily to a lifetime supply of his favorite food. Within weeks, however, the *he’e* of Pā’ā disappeared. Keakianoho sent for his kahuna Kāne-a-ka-lua to discover the reason for this lack. The priest hid on the ridge above and soon saw a giant crab with eleven dark red spots on its back emerge from a hole in the ground and enter the ocean. After a time it returned, bearing *he’e* in its claws, and disappeared into the hole.

When the *konohiki* and his soldiers found the hole, they saw that it led underground into a network of large caves where they found a handful of defeated Kona warriors and a fierce battle took place. At the end, none of the enemy survived. The caves were searched for the large crab, but it was never seen again. Shortly thereafter, however, the reef for Pā’ā became filled with little ‘*alamuku* crabs, each bearing eleven red spots on its back. (Wichman 1998:46)

3.4 ‘Ōlelo No’eau (Proverbs and Poetic Sayings)

One ‘ōlelo no’eau are associated with Kōloa and aspects of its lifeways.

Aia i Kōloa Is at Kōloa

A play on *kō* (drawn) and *loa* (long)- drawn a long way under. Drunk (Pukui 1983: 8).

3.5 Subsistence and Settlement

The project area is situated within the Kōloa District on the island of Kaua’i. Few records exist that document traditional Hawaiian life in the *ahupua’a* of Kōloa. While settlement by westerners with religious and commercial interests made the area a focus of documentation after the first quarter of the 19th century, the accounts generally emphasized the lives and concerns of the westerners themselves, with only anecdotal references to the Hawaiian population. Two 19th century documents, the Boundary Commission Testimony of 1874 and a Lahainaluna manuscript of 1885, however, provide insight into the history of Kōloa before the arrival of westerners.

A dispute over the northern boundary of Kōloa *Ahupua’a* in 1874 led to a hearing before Duncan McBryde, the Commissioner of Boundaries for Kaua’i. One native witness, Nao (who described himself as born in Kōloa but presently living in Ha’ikā), in order to show that Hoaea (the area in dispute) was indeed at the northern boundary of Kōloa, testified: “At Hoaea, tea [*sic*] leaves were hung up to show that there were battles going on” (Boundary Commission, Kaua’i, vol. 1, 1874:124). That there were traditional “warning systems” well-known to all natives suggests that Kōloa may well have been the scene of some serious conflicts. Throughout the

early settlement history of Kōloa, conflicts must have occurred at intervals serious enough and often enough to warrant having to devise such a system.

Additional evidence of a rich history within Kōloa was offered in a Lahainaluna document produced eleven years later. This document appeared to have been based on an oral history project. On September 7, 1885 a student from Lahainaluna Schools (HMS 43 #17) interviewed Makea – "a native who is well acquainted with Kōloa" -- and recorded "what she said about the well-known places in the olden times." More than sixty-four years after the abolition of the *kapu* (taboo) system and almost as many years after contact with westerners, Makea was able to describe fourteen *heiau* (religious structures) within the Kōloa area.

3.5.1 Agricultural

Bernice Judd, writing in 1935, summarized most of what was known of the traditional Hawaiian life of Kōloa:

In the old days two large *'auwai* or ditches left the southern end of the Maulili pool to supply the taro patches to the east and west. On the *kuūmas* [embankments] the natives grew bananas and sugar cane for convenience in irrigating. Along the coast they had fish ponds and salt pans, ruins of which are still to be seen. Their dry land farming was done on the *kula* (dry land), where they raised sweet potatoes, of which both the tubers and the leaves were good to eat. The Hawaiians planted *pia* (arrowroot) as well as *wauke* (paper mulberry) in patches in the hills wherever they would grow naturally with but little cultivation. In the uplands they also gathered the leaves of the *hala* (screwpine) for mats and the nuts of the *kukui* (candlenut) for light. (Judd 1935:53)

Beginning possibly as early as 1450, the "Kōloa Field System" was planned and built on the shallow lava soils to the east and west of Waikomo Stream. The Kōloa Field System is characterized as a network of fields of both irrigated and dryland crops, built mainly upon one stream system. Waikomo Stream was adapted into an inverted tree model with smaller branches leading off larger branches. The associated dispersed housing and field shelters were located among the fields, particularly at junctions of the irrigation ditches (*'auwai*). In this way, the whole of the field system was contained within the entire *makai* (seaward) portion of the *ahupua'a* of Kōloa, stretching east and west to the *ahupua'a* boundaries.

The field system, with associated clusters of permanent extended family habitations, was in place by the middle of the 16th century and was certainly expanded and intensified continuously from that time. Long *'auwai* were constructed along the tops of topographic high points formed by northeast to southwest oriented Kōloa lava flows, and extended all the way to the sea. Habitation sites, including small house platforms, enclosures and L-shaped shelters were built in rocky bluff areas which occupied high points in the landscape and were therefore close to *'auwai*, which typically ran along the side of these bluffs (Hammatt et al. 2004). From A.D. 1650-1795, the Hawaiian Islands were typified by the development of large communal residences, religious structures and an intensification of agriculture. Large *heiau* in Kōloa may date to this period.

3.5.2 Salt

The manufacture of salt was important for the Native Hawaiians. Many of the larger salt pans on Kaua'i are located near Nōmilu, "where people came in the summer to gather salt when the winds blow the salt across the surface of the pond at the edge of the pond where it was carefully scooped out with the hands or with pieces of gourd shell and dried" (Wichman 1998:35). The importance of salt manufacture in the area was illustrated in the 1874 Boundary Commission determination for Kōloa, where the oral testimony of Pene Kalauau claimed he had come all the way "from Koolau to go to Koloa for salt" (Boundary Commission, 1874, Kauai, Vol. No. 1:124) Other salt pans were noted at Kane-milo-hai and at Pau-a-Laka adjacent to the [older coastal] road [at Kōloa] (Kikuchi 1963:66-67). At Pā'ā, "the seafont is dominated by a crescent beach called Ke-one-loa, "long beach," where there were *kuakua pa'akai* (salt ponds)" (Wichman 1998:45).

3.6 Heiau (Place of Worship, Temple)

Clearly Kōloa was a particularly important *ahupua'a* in traditional Hawaiian times. The fact that at least fourteen *heiau* of varying sizes and functions have been documented in the Kōloa area (Thrum 1907, Bennett 1931), and that these *heiau* are associated with many legendary-historic figures such as Kawelo and 'Aikanaka, suggests a heightened cultural richness of the *ahupua'a*.

In the 1885 Lahainaluna Schools document, Makea was able to describe fourteen *heiau* (religious structures) within the Kōloa area. Of the 14 *heiau* five were associated with human and animal blood sacrifices (*luakini* and *po'okanaka*), five with fishing, two medicinal, and one agricultural, with one of unknown function (Lahainaluna 1885 HMS 43 #17).

The Maulili *heiau* was first built by Ka-pueo-maka-walu, the son of Kapu-lau-kī. It was a place of human sacrifice (Wichman 1998:12). This *heiau* may be the Maulili *Heiau* described by Makea in the Lahainaluna document mentioned above.

Thomas Thrum was the next to document sites in the Kōloa area in his list of the *heiau* of Kaua'i (Thrum 1907). He discussed six *heiau* in the district of Kōloa, which once extended from Hanapē to Māhā'ulepū (Table 3). The *heiau* were Hanakalauae (Kōloa Ahupua'a), Kanehaule (inland Kōloa Ahupua'a), Kihouna (Kōloa Ahupua'a), Kaneiolouma (Kōloa Ahupua'a), Weliweli (Weliweli Ahupua'a), and Waiopili (Māhā'ulepū Ahupua'a) (Thrum 1907).

3.7 Lava Tubes and Caves

There are many underground lava tubes and caves in the Kōloa *ahupua'a*. William K. Kikuchi in a 1963 archaeological survey of Kaua'i states that "A great many caves were reported for the area back of the beaches of Koloa. The last eruption for the island of Kaua'i is reported to be in the lava fields of Koloa. Thus the relatively recent and fresh pahoehoe lava fields and the numerous lava tubes" (Kikuchi 1963:49). He goes on to talk about the specific caves , near the project area, "In the area between Koloa town, Koloa Mill and the flat pahoehoe lands below Kaluahonu (Waitah or Koloa reservoir) several caves and shelters were found" (Kikuchi 1963: 55).

Section 4 Historical Background

4.1 Early Historic Period

By the early 1800's, Kōloa Landing had become the principal port of Kaua'i. Shipments of North American furs and pelts to the Orient depended on the provisioning of ships at Kōloa Landing, as well as other Hawaiian ports. As the fur trade grew, markets in China became aware of sandalwood (*Santalum sp.*) grown in the Hawaiian Islands. The shipment of most of Kaua'i's sandalwood to the Orient took place at Kōloa Landing, until the supply of the fragrant wood was exhausted around 1830.

Accounts by visitors and settlers at Kōloa focused on the early westerners' own concerns--religious and commercial--as they appeared within the historical record of Kōloa in the 1800s. However, scattered throughout the accounts are occasional references to the Hawaiians of Kōloa that may give some insights into their lives.

The American Board of Commissioners for Foreign Missions (ABCFM) missionary Samuel Whitney described, in an article in the *Missionary Herald* (June 1827:12), a visit to Kōloa with Kaikio'ewa, the governor of Kaua'i, in 1826:

The people of this place were collected in front of the house where the old chief lodged in order to hear his instructions. After a ceremony of shaking hands with men, women, and children they retired...

Our company consisted of more than a hundred persons of all ranks. The wife of the chief, with her train of female attendants, went before. The governor, seated on a large white mule with a Spaniard to lead him, and myself by his side, followed next. A large company of aipupu, ['ā'īpu'upu'u] cooks, attendants came on in the rear.

Whitney's account above suggests something of the deference paid to the *ali'i* (chiefs) by the local populations and the scale at which the *ali'i* carried out their functions. An even grander view of that deference was provided in an account of a later visit by an *ali'i* to Kōloa. John Townsend, a naturalist staying in Kōloa in 1834, described a visit by Kamehameha III (In Palama and Stauder 1973:18):

In the afternoon, the natives from all parts of the island began to flock to the king's temporary residence. The petty chiefs, and head men of the villages, were mounted upon all sorts of horses from the high-headed and high-mettled California steed, to the shaggy and diminutive poney [sic] raised on their natives hills; men, women, and children were running on foot, laden with pigs, calabashes of Poe [sic], and every production of the soil; and though last certainly not least, in the evening there came the troops of the island, with fife and drum, and 'tinkling cymbal' to form a body guard for his majesty, the king. Little houses were put up all around the vicinity, and thatched in an incredibly short space of time, and when Mr. Nuttall, and myself visited the royal mansion, after nightfall, we found the whole neighborhood metamorphosed; a beautiful little village had

sprung up as by magic, and the retired studio of the naturalists had been transformed into a royal banquet hall. (Palama and Stauder 1973:18)

In 1835, Thomas Nuttall and John K. Townsend, two American naturalists, visited the Kōloa area. They noted "fields of taro, yam, and maize (possibly sugar cane), irrigation networks and sweet potato patches in the dryer areas" (Townsend 1839:206).

On December 31, 1834, Peter Gulick and his family arrived in Kōloa. Apparently the first foreigners to settle in the *ahupua'a*, they initiated the process of rapid change that would re-shape the life of Kōloa in the nineteenth century. In 1835, a 30 by 60 foot grass house was erected as a meeting-house and school near the Maulili Pond. Mr. Gulick cultivated sugar cane and collected a cattle herd for the Protestant Mission. In 1837, a 45 by 90-foot adobe church was built where Kōloa Church stands today, and the first mission doctor, Thomas Lafon, arrived to assist Mr. Gulick (Damon 1931:179, 187). The Kōloa mission station apparently flourished immediately. Navy Lieutenant Charles Wilkes, a member of the U.S. Exploring Expedition, during his visit to Kōloa in 1840 recorded:

The population in 1840, was one thousand three hundred and forty-eight. There is a church with one hundred and twenty-six members, but no schools. The teachers set apart for this service were employed by the chiefs, who frequently make use of them to keep their accounts, gather in their taxes &c. The population is here again increasing partly by immigration, whence it was difficult to ascertain its ratio. (Wilkes 1845:64)

Kōloa Village and Kōloa Landing, at the mouth of the Waikomo Stream, became flourishing commercial centers as trade with Americans and Europeans grew. An estimate in 1857 stated that "10,000 barrels of sweet potatoes were grown each year at Kōloa, and that the crop furnished nearly all the potatoes sent to California from Hawai'i" (Judd 1935:326). Sugar and molasses were also chief articles of export. Whalers used the Kōloa "Roadstead" from 1830 to 1870, and took on provisions of squashes (pumpkins), salt beef, pigs, and cattle (Damon 1931:176). Hawaiians grew the pumpkins on the rocky land north of the landing. There were also numerous salt pans along the shore near the landing that were used to make the salt (Palama and Stauder 1973:20).

4.2 Mid-1800s and the Great Māhele

In the early Post-Contact period, the *ahupua'a* of Kōloa was controlled by the ruling chief of Kaua'i and was administered by lesser chiefs appointed by him. When Ka-umu-ali-i, last of the ruling chiefs of the island, died in 1824, his lands (Kaua'i and Ni'ihau) were given to the lineal descendants of Kamehameha. Queen Ka'ahumanu redistributed the lands among chiefs of other islands who had been loyal to the bloodline of Kamehameha. By the mid-19th century, control of the *ahupua'a* of Kōloa was divided between Kamehameha III and Moses Kekūāiwa, a brother of Kamehameha IV (Alexander 1937). The Māhele Award records indicate that Kōloa Ahupua'a, which totaled 8,620 acres, was granted by way of a Land Commission Award (LCA) to Moses Kekūāiwa, (the brother of Alexander Liholiho [Kamehameha IV]), Lot Kapuāiwa (Kamehameha V), and Victoria Kamāmālu (LCA 7714-B: Waihona 'Aina 2000).

Eighty-nine *kuleana* awards were given to individuals within Kōloa Ahupua'a. The majority of these Land Commission Awards (LCAs) were located in and around Kōloa Town itself. No

LCAs were granted within the present project area; however an 1891 map of Kōloa by M.D. Monsarrat indicates two LCAs (LCA 3606 and 10272) in the vicinity of the southwest portion of the project area (Figure 6 & Table 1), and three LCAs (LCA 6667, 6309, and 3584) in the vicinity of the northwest portion of the project area (Figure 7 & Table 2).

LCA 3606 transferred a section of the 'ili of Pu'u-ohaku to the claimant "Kamae" using the traditional "metes and bounds" description in use at the time. Distance was measured in "chains." An amount of "kula" land, twelve taro patches, two potato patches, a house lot, and a cattle yard were claimed as appurtenant to LCA 3606. There was a reference within this LCA to the planting of "sugar cane and yams" before 1848 (No. 3606, Kamae, Koloa, Kauai, January 12, 1848, Native Register 71v9/ Foreign Testimony 30-31v13/ Native Testimony 35v13, Royal Patent 7269).

LCA 10272 transferred a section of the 'ili of Ma'ulili to the claimant "Makalulu" using traditional boundary descriptions. An amount of "kula" land, a house lot, one taro patch, and four dry taro patches were claimed as appurtenant to LCA 10272 (No. 10272, Makalulu, Koloa, Kauai, January 7, 1848, Native Register 272v9/ Foreign Testimony 24v13/ Native testimony 27v13, Royal Patent 8367, Registration Map 1694 Monsarrat).

Testimonies provided to the Land Commission by applicants of LCAs 3584, 6309 and 6667 were generally limited to stating the boundaries of their claimed lands as well as land use. All three LCAs are indicated as being enclosed by stone walls and note the presence of additional house lots and *lo'i* of other claimants in the vicinity. Of particular interest are the stated boundaries of LCA 6309, which indicated the presence of pasture lands immediately *puna* (east) of the LCA. This may explain the presence of numerous stone walls described in the land claims and shown on the 1891 Monsarrat map, a portion of which is shown running through the project area (see Figure 7). These walls are likely cattle barriers used to keep cattle out of house lots and agricultural plots.

A review of Māhele documents (LCAs) indicates that in the vicinity of the southwest and northwest portions of the project area, land usage and activity by the mid-nineteenth century included habitation, cattle ranching, and agriculture, including the cultivation of taro, sugar, potatoes, and yams. This may reflect the continuation into that century of traditional Hawaiian land use within the project area.

The 1891 Monsarrat map also indicates taro and associated walls located in the vicinity of the southwest portion of the project area, and numerous walls, fences, and structures in the vicinity of the northwest portion of the project area (see Figure 6 & Figure 7) This suggests that taro cultivation may have occurred within the southern portion of the project area, and the habitation, agriculture, and ranching may have occurred within the northwestern portion of the project area.

The Koloa Sugar Company began commercial operation in the late 1840's with about 450 acres of Kōloa land under cultivation. Development of additional acreage continued gradually. A 1935 map of Koloa Sugar Company shows the extent of cane lands within the project area (Figure 8).

In 1882, the Koloa Sugar Company announced it had ordered all the components for a plantation railroad. According to the *Planter's Monthly*, Volume 1 of 1882, "It (the railroad) will consist of four miles of 30 inch gauge track, forty cars 5 x 10 feet, and one locomotive..." (Conde

1993:28). According to Arthur C. Alexander, in *Koloa Plantation 1835-1935*, "Cut cane was hauled to the mill by oxcart until 1882. In that year, 3½ miles of 30-inch gauge, 18 pound railroad track and 50 cars were purchased" (Conde 1993: 28).

By 1885, the railway extended to Kōloa Landing where steamers transported the bags of sugar to the mainland (Figure 9). A motorized derrick winched the bagged sugar from the railroad cars to the warehouse on the west side of the landing. From there, bagged sugar was loaded onto small lighters, which would row the sugar out to waiting ships in the harbor. By 1895, the railroad had extended a spur line through the coastal lands of Kōloa into Weliweli to aid in the harvest around Pā'ā. Remnants of this spur line are seen today throughout lower Po'ipū, and include the stacked basalt railroad berm located in the vicinity of the southwestern portion of the present project area.

Table 1. Land Commission Awards in the vicinity of the southwest portion of the project area

LCA	Awardee	'Ili	Land Use
3606	Kamae	Pu'u-ohaku	<i>Kula</i> land, twelve taro patches, two potato patches, a house lot, and a cattle yard
10272	Makalulu	Ma'uili	<i>Lo'i, kula</i> , house lot, and four dry taro patches

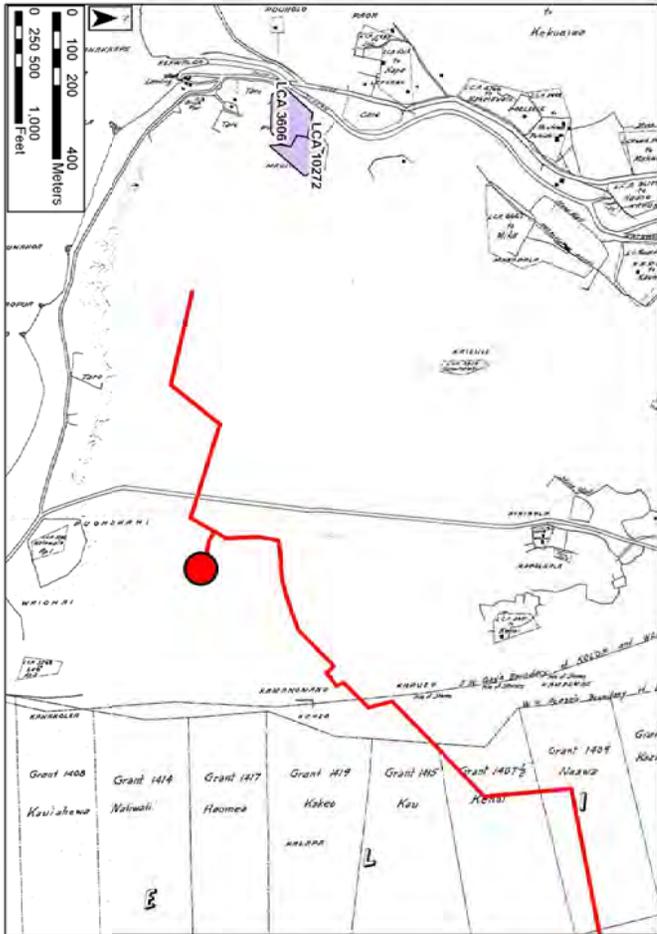


Figure 6. Portion of 1891 Map of Koloa by M.D. Monsarrat (R.M. 1694), showing the location of the southwest portion of the project area (indicated in red) and Land Commission Awards (LCAs) in the vicinity

Cultural Impact Assessment for the Proposed Kōloa-Po'ipū Regional WRF & Collection System

TMK: [4] 2-8-004; [4] 2-8-008; [4] 2-8-009; [4] 2-8-011; [4] 2-8-014; [4] 2-8-022; [4] 2-9-001

Table 2. Land Commission Awards in the vicinity of the northwest portion of the project area

LCA	Awardee	'Ili	Land Use
3584	Kaanaana	Ma'ulili	House lot
6309	Kapuniaia, Elia	Hakeku	House lot
6667	Kailihakuma, Mika	Wailua	Lo'i & sugarcane

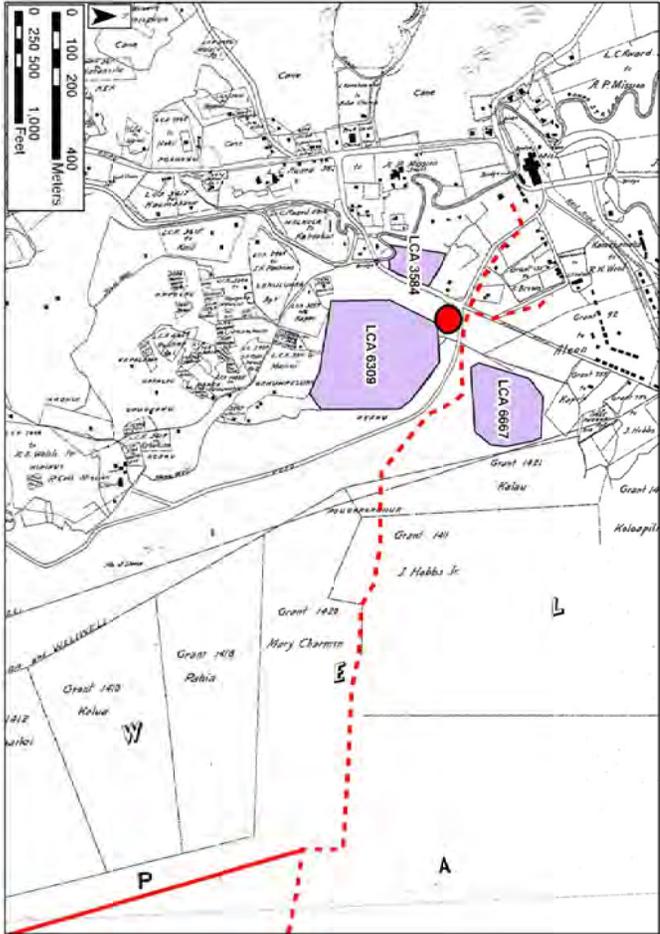


Figure 7. Portion of 1891 Map of Koloa by M.D. Monsarrat (R.M. 1694), showing the location of the northwest portion of the project area (indicated in red) and Land Commission Awards (LCAs) in the vicinity

Cultural Impact Assessment for the Proposed Kōloa-Po'ipū Regional WRF & Collection System

TMK: [4] 2-8-004; [4] 2-8-008; [4] 2-8-009; [4] 2-8-011; [4] 2-8-014; [4] 2-8-022; [4] 2-9-001

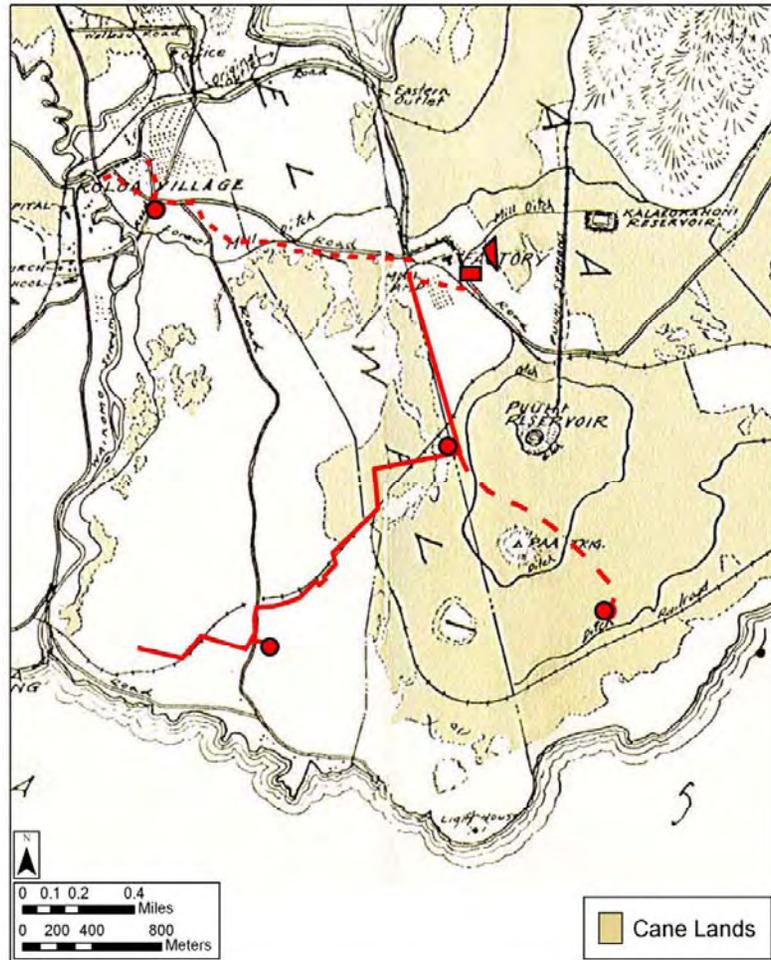


Figure 8. Portion of 1935 Koloa Sugar Company map showing the extent of cane lands within the project area

4.3 1900s

The Koloa Sugar Company had previously purchased the *ahupua'a* of Pā'ā southeast of Kōloa town, and a large parcel of it was unproductive. A new and much larger mill was built there in 1912 about a mile from Kōloa (Figure 10). New railroad track was laid, and an asphalt road was built to connect the new mill with Kōloa Landing. World War I caused a huge demand for sugar. By the end of hostilities in 1918, the Koloa Sugar Company was producing 9,000 tons of sugar each year, and adding additional acreage.

Kōloa Landing was phased out around 1925 when McBryde Sugar Company and the Koloa Sugar Company began shipping their product out of Port Allen Harbor at Hanapēpē. The McBryde Plantation had been improving the facilities at 'Ele'ele Landing since the turn of the century, and a private company, the Kauai Terminal Limited Railway, had developed a modern bridge crossing the Hanapēpē River. Soon after this, the Koloa Sugar Company ceased to use the *makai* (seaward) Kōloa fields, and much of the area was converted into cattle-grazing pasture by the Knudsen family. Most of the *mauka* (upland) areas of Kōloa remained under sugar cane cultivation as late as the 1970s, when these cane lands were converted into pasture.

According to Wilcox's account of the Koloa Sugar Company (1996:77-78), following the merger of the plantation lands of the Koloa Sugar Company and Grove Farm Company in 1948, the combined lands under cultivation required new sources of irrigation water. In 1965, Grove Farm built a tunnel to bring the waters from Ku'ia directly into the Waitā (Kōloa) Reservoir. Grove Farm leased these cane lands to McBryde Sugar Company when it terminated sugar operations in 1974. The mill in Pā'ā was finally closed in 1996, and remains a landmark of the countryside.

The Tax Map of Section (4) 2-8 made in 1936 (Figure 11) shows a dotted area enclosing a portion of the southwestern project area. This area is labeled "House Sites, Fireplaces; Lava Tubes; Enclosures, and Taro Patches in This Area." This map also shows a pond just south (*makai*) of the current project area, with the words "Fish Pond and Taro Patch." A second pond is located southeast of the current project area and labeled "Pa'u a Laka, Salt Ponds."

4.4 Modern Land Use

By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline. Although the town had established a Civic Center in 1977, the pace of tourism-driven development at the shoreline had been drawing construction and service jobs away from the town center. The Kīahuna Plantation Resort opened in 1967, followed by the construction of various condominiums throughout the 70's and 80's. Finally, the Hyatt Regency Resort, with its expansive golf course, opened in 1991.

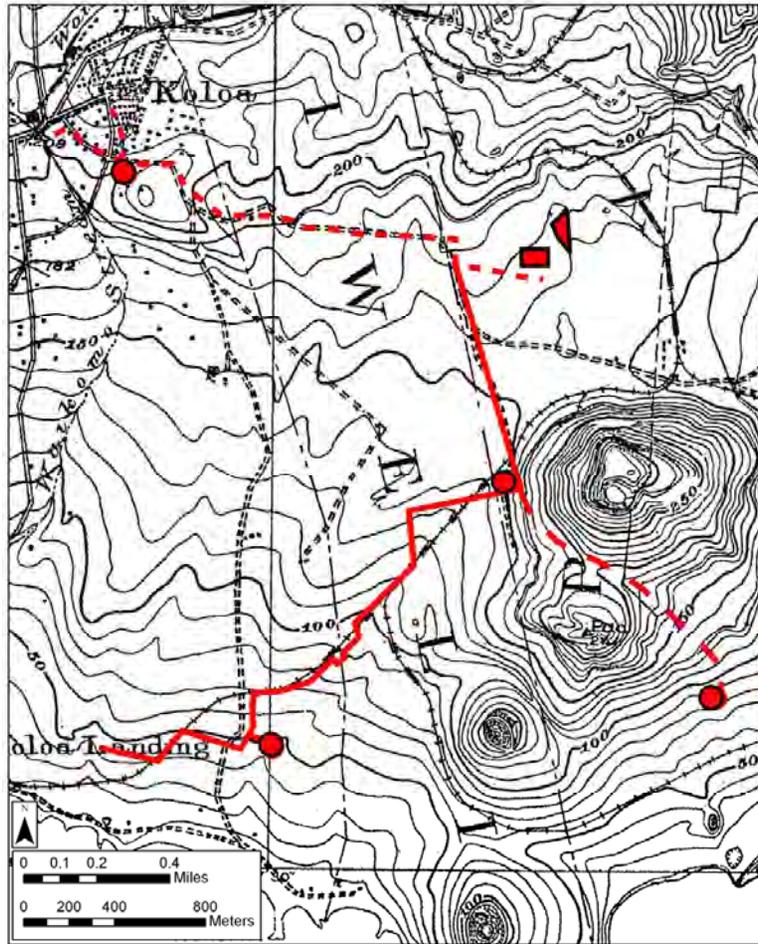


Figure 9. 1910 USGS topographic map, Lihue Quadrangle, showing the network of railroad tracks within the Kōloa District. Note that a majority of the project area (indicated in red) is situated within either railroad right-of-ways or cane haul roads.

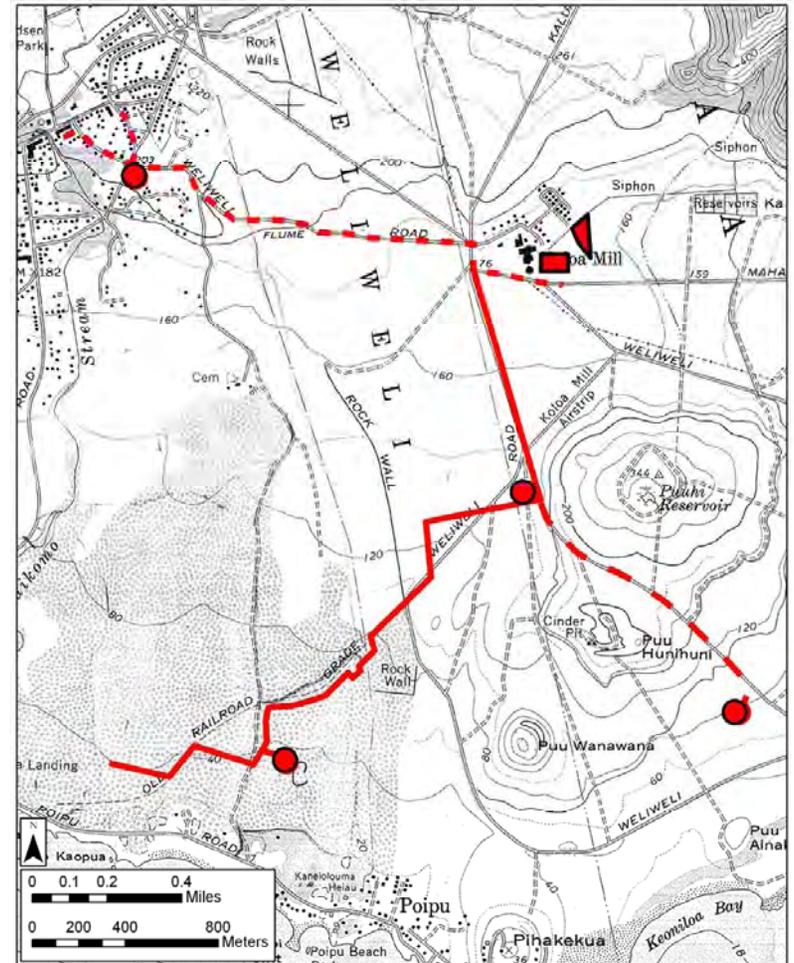


Figure 10. 1963 USGS topographic map, Kōloa Quadrangle, showing the location of newly constructed (circa 1912) sugar mill in relation to the project area

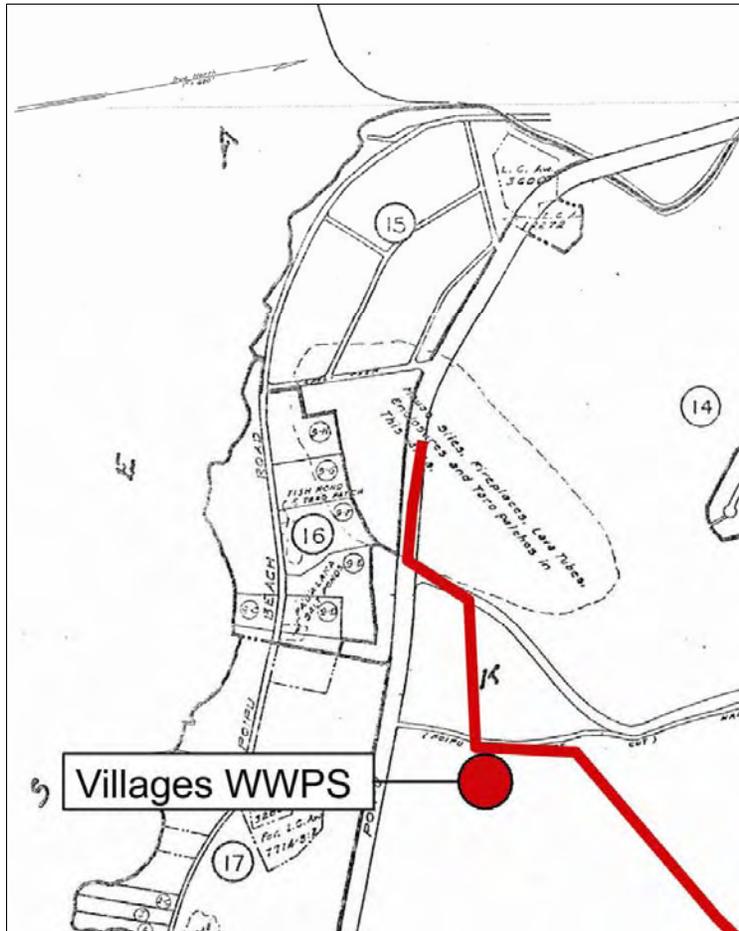


Figure 11. Portion of Tax Map Key (4) 2-8, (c. 1935) Note annotations “Fishpond and Taro Patch” just south of project area (indicated in red) and “House Sites, Fireplaces; Lava Tubes; Enclosures and Taro Patches in this Area” enclosing a portion of the southwest section of the project area.

According to Donohugh (2001), by the early 1990's, the tourist industry had successfully attached the name “Po'ipū Beach” to the entire coastline beginning at Kōloa Landing, and continuing east to Makahū'ena Ledge. With the development of the Po'ipū Bay Resort Golf Course and the Hyatt Regency Kaua'i Resort Hotel, the Po'ipū Beach name became synonymous with all two miles of coastline fronting the Wai'ohai, Kīahuna, and Sheraton developments; ending at Po'ipū Beach Park (Donohugh 2001: 244).

Future plans within the Kōloa District will place more demands on beachfront properties along the coastline. According to Donohugh (2001:258), over 1,000 acres of former sugar plantation lands are slated for hotel and condominium development surrounding both Lāwa'i and Po'ipū coastal resort areas). Future development plans for the upland areas involve both large tracts of lands, as well as regional redevelopment within Kōloa Town itself.

4.5 Prior Oral History Research in the Project Area

4.5.1 University of Hawai'i Ethnic Studies Department Oral History Project: *Kōloa: An Oral History of a Kaua'i Community*

There have been a number of oral history projects conducted with residents of the Kōloa area. Most notable is a three-volume report by the University of Hawai'i's Ethnic Studies Department Oral History Project called *Kōloa: An Oral History of a Kaua'i Community*, published in 1987. The intent of the UH Oral History Project is to document through research and interviews the histories of communities in Hawai'i undergoing rapid and large scale social, economic and environmental changes (UH 1988: xlv). The report begins by describing the changes in Kōloa:

Kōloa is the site of Hawai'i's first commercial sugar plantation founded in 1835... However, since the 1960's, Kōloa together with it's neighboring shoreline community of Po'ipū has experienced tremendous change. And undeveloped shoreline, fields of sugarcane and a quiet plantation town are giving way to resort hotels, condominiums, golf courses, upscale boutiques and restaurants catering to tourists and wealthy newcomers.

Because of those developments, some Kōloa residents have been buoyed by an overall stimulation of the community's economy and the prospect of jobs for the young. Others have expressed reservations about the influx of visitors and newly-arrived residents, crowded streets and beaches, soaring property values, and the disruption of their rural, agricultural lifestyle (University of Hawaii 1998: xlv).

The following is a summary of some of the interviews pertinent to the current project area.

Burt Hiroshi Ebata says, “Well, I know that we used to go up the mountains to get mountain apples, you know, mostly in the area behind the Waitā Reservoir, which in the old days they used to call the Marsh Reservoir” (University of Hawaii 1988: 11). He also described picking mangoes and java plums. When asked if he ever went fishing at the reservoir, Mr. Ebata stated that Herman Steljas, a *luna* (foreman, boss) at Kōloa Sugar Company, would keep the kids away from Waitā Reservoir. Although it was a restricted area, the kids would catch goldfish. He also remembered big 'o'opu (general name for fishes included in the families *Eleotridae*, *Gobiidae*, and *Blennidaethere*) as well. Once the Reservoir “dried up” because of a drought, and he “saw

all the huge 'o'opu there." He also added that they had catfish and 'ōpae (shrimp) in the mountain streams in the Māhā'ulepū area. He and his childhood friends would catch 'ōpae in big ditches. There were also frogs in the big ditches. He also recalled swimming in Wailana (also known as Waikomo) Stream, the Waitā Reservoir and in the stream along the Kōloa Fire Station.

"Because the one stream [Waihohonu Stream] came past the fire station and then the other stream came from 'Ōma'o. Came right there, that's right. And there's a dam over there. Small dam. ['Ōma'o Stream and Waihohonu Stream merge mauka of the old sugar mill site to Waikomo Stream which flows to the ocean. Old timers also refer to Waikomo Stream and Wailana.] (UH 1988:15).

Louis Jacintho, Jr. was born on December 19, 1924 in Kōloa Sugar Company Portuguese Camp. At 14, Louis began working as a full time employee for Kōloa Sugar. Following the merger of Kōloa Sugar Company and Grove Farm in 1940, he assisted the transition and eventually became crew chief in the herbicide department. When McBryde Sugar Company bought out Grove Farm in 1974 Louis became irrigation supervisor (University of Hawaii 1998: 107).

When asked what he did for fun as kids, he said, "In those days, actually, what we used to do is to go in the pastures, get mangoes, or go up into the mountains, get mountain apples, rose apples, up on the hill "guaivis," you know, the Hawaiian guava. Swimming in the plantation ditches. Swimming in Wailana" (University of Hawaii 1988: 107).

Mr. Jacintho recalled the railroad, "Well the railroad would go up to Waitā, and then would come down. From Waitā would come straight down here to where Big Save is. And the rest of the railroad would go up mauka up to the Highway. So, up Kāhili. And then, during the Second World War, they connected the railroad there to Grove Farm, you know, during the wartime. Used to end up there right where the intersection is, the tunnel of trees" (University of Hawaii 1988:111).

He also reminisced about the different fruits he'd pick and eat. "Choke plum, actually, is java plum, it grows wild on the island here. We call 'em, 'choke plum'" (University of Hawaii 1988:118). He and his friends would pick the plums, put them in jars and add salt, shake it up and eat them. Eventually, he said, you would have a hard time swallowing because of the tartness of the fruit. His father also made wine from the fruit. "Guaivi is the Hawaiian guava. A red one and the yellow one. That thing grows wild, too, you know. That's sweet. But we were hungry all the time, so we'd eat all those things" (University of Hawaii 1988: 119).

When asked about the fish in Waitā Reservoir Mr. Jacintho remembers carp- regular *koi* (*Cyprinus carpio*) and goldfish, *kingyo*. "They weren't to eat, just pretty to look at. Charley Rice from the Kīpu Ranch introduced the charley fish, a largemouth bass just before the Second World War. The bass would eat the goldfish. Then there was bluegill in the Reservoir. Bluegill, *koi* and then tilapia" (University of Hawaii 1998:199). During his interview in 1987, Mr. Jacintho stated that the fish in the reservoir were tilapia, largemouth bass, and more recently tucanan, which are like bass from Argentina. There was also *pākē*, 'o'opu, or catfish. In the plantation ditches, there was 'o'opu. He was a caretaker of the tunnels, where the ditch came from the Lihu'e powerhouse and in the tunnels, there was 'ōpae (University of Hawaii 1998:199).

Mitsugi (Mitaru) Muraoka was born in 1905 at Lāwai Stable Camp. At 9, he moved to Kōloa and worked at Kōloa Sugar Company for 50 years.

He began fishing at an early age and later started hunting at about 20 years old. He hunted "all around the Waitā side" (University of Hawaii 1998: 348) He also said that he would bring a good hunting dog and that the area was covered in tall buffalo grass.

And those days used to be plenty birds. And I hear the [territory] used to release the pheasants, you know. About 3 months before the hunting, they used to release the cocks. Because the hens are plenty, yeah? And that was good because when we started to go hunt, well, lot of pheasant. The hunting start November. You can hunt everyday. During weekends, Saturday, Sunday, holidays, you can. But today, you can only hunt weekends and holidays, that's all. And they only allow you three birds a day. But those days, lot of time, especially like the weekend like that, we go. During the week, we only go in the afternoon sometime when the weather is good. But weekend, sometimes we go in the morning. We shoot three in the morning. And then, in afternoon, you take a rest, you have lunch, and maybe you start again maybe about 1:30, 2 o'clock, you shoot another three. Lot of time. Not every time, though. Yeah, when you get luck, eh? (University of Hawaii 1988: 348)

About the crater, Edene Naleimaile Vidinha, born in 1905, said, "...the olden days, down in the crater, the Hawaiians used to plant watermelons and potatoes, never saw anything like that. So now, it's filled with houses" (University of Hawaii 1988: 536).

Abraham Keli'iokapalapala Aka, born in 1915, discussed salt making in Kōloa:

When come summertime like that, the pond all, just before summer springwater that came in from underneath. So what the Hawaiians used to do, they make bed, rocks and everything, and then let 'em stand. Water get inside. Then the sun rays heat 'em. Then you see, just like snow get on top, eh. They come, they check 'em, "Oh, ah. Leave 'em." Go maybe another day or two. Next time they come, "Hey pretty good." So they tap 'em. Tap 'em with their hand or a piece of stick. Just tap 'em and then the salt on the top, not too much- then it sinks to the bottom. Every other day they come, go, go, bumbai [by and by], all of a sudden you say, "Hey, there's a lot of salt." So what they do, they drain the water. Take the water out, and then leave the pond like that. Then the sun hit the salt, then it dries 'em up, eh. So they pick 'em all up, they rake 'em, put 'em all together like that. Make 'em into a pile. Then they pick 'em up, put 'em in any kind container. Then they bring 'em home, make a rack, then throw all the salt inside. Then put maybe wooden horses, like that. Then they make a big box, put all the salt on top where the sun can get 'em. It goes like that until its really dry. Then they take 'em, and they smash 'em all up. Smash 'em all with a, just like a poi pounder, eh. Make 'em nice and small like that. Then if you like the salt white, as it is, it's up to you. Or you like dye 'em red, they have that some kind of stone that they get. 'Ālaea, they call, 'ālaea. Then you get your red salt, eh. [Then they rubbed the salt with the 'ālaea.] And then, it can be coarse, the 'ālaea like that, then dilute 'em. It comes just like water, dye 'em. That's only for, you know, when you eat raw fish

or cooking like that. The rest [of the white salt] if you going- what we used to do, kill maybe one big steer like that. And then my father used to take so much, put 'em in barrels, eh. And put plenty salt, you know. But you use the [white] salt mostly for salting beef. (University of Hawaii: 1988: 849-850)

Isaac Brandt, born in 1905, grew up in a place called Banana Camp in Kōloa. He eventually became the timekeeper at the plantation. He said this about hunting:

My father was a hunter. He liked to go out for pheasant hunting. The birds, were plentiful then and he had a shotgun. And he'd go out Sunday's when there was no work on the plantation, and during the weekday, he'd spot the pheasants and what location they were, where they were at, and he'd go out, and get, always come home with pheasants. And Mother would pluck the feathers, the beautiful feathers, and eventually make feather leis for our hats. (University of Hawaii: 1988: 920).

According to Katherine Bukoski Viveiros, "Kaluahonu Cave is close by the Waita reservoir. The plantation used to dump human waste and rubbish from all the camps into this very large cave" (University of Hawaii 1998: 697-698).

4.5.2 Past Cultural Surveys Hawai'i Cultural Impact Assessments in Kōloa

Reginald Gage

Mr. Gage granted permission for CSH to include pertinent excerpts from the interview on Kōloa conducted in 2005 (Mitchell et al. 2005a):

Reginald Gage was born in Chicago, Illinois in the year 1935 to Reginald Gage and Evelyn Gage. His parents came to Hawai'i during WW II, and he followed after the conclusion of the war in 1945 aboard the SS Lurline. Mr. Gage was raised in Mānoa and Kahala and later graduated from the University of Hawai'i Mānoa with a Bachelor's Degree in Business Education. After working several years on the island of Maui he became an appraiser. He was later offered the job of Chief Appraiser for the County of Kaua'i. Mr. Gage came to Kaua'i in 1968 and has been here ever since, living in the Kōloa (Kona) District and in Kalāheo. Mr. Gage serves on the Board of Directors of the Kaua'i Historical Society.

When asked about Hawaiian place names specifically in Kōloa, Mr. Gage remembered:

I believe Kōloa got its name from the ducks. There was a wetland in back of Kōloa in ancient history. The wetland was drained by Kōloa Sugar and some of it was dammed to make the Waipā Reservoir, but much of the wetland was drained. Prehistorically there were many ducks in Kōloa. The people from McBryde Plantation think *kō* is cane and *loa* is long, they think it means "long cane", but I think it is historically inaccurate. I have read about the steep rock (Pali-O-Kōloa) on the east bank of the Waikomo Stream in *Thrum's Hawaiian Annual*. There is supposed to be a petroglyph on it and also a picture, but I have never seen it.

Mr. Gage mentioned that there are legends associated with Kōloa:

Frederick Wichman is the guy who wrote about Kaua'i legends. His grandfather was Charlie Rice, and he wrote an early text on legends. Wichman used to collect those kinds of things and other books. So Wichman would be an excellent source for the legends. He and I sit on the Board of Directors for the Kaua'i Historical Society. He is the President of the Board, and I am Vice-President.

Regarding cultural practices [in Kōloa], Mr. Gage noted:

I have not witnessed any gathering of resources or cultural practices by Native Hawaiians or other ethnic groups during my lifetime other than the cultivation of sugar cane. Prehistorically, Kōloa was an area inhabited by the Hawaiians, and they used it for agriculture, not in the sense as we think of agriculture today, because it was a dry area. All throughout the Kōloa region there were *'auwai*. The *'auwai* were bringing water into the Kōloa area. I think Kōloa was primarily used to grow sweet potato and dryland taro. Primarily sweet potato was grown with *'auwai* bringing in water to the fields and the water coming from Waipā and Waikomo streams.

Asked about his knowledge of any cultural sites, trails or burials within the project area Mr. Gage stated:

...I know a great deal about caves in Kōloa because of my work with Storrs Olson, a curator of birds at the Smithsonian Institution. He is an ornithologist. We have searched the caves in Kōloa for bird remains and looking back I cannot recall ever having seen a burial in Kōloa, except along the shorelines. There were many burials along the shorelines, but not in caves. I think the Kōloa caves were most likely used for habitation rather than burials.

Kaua'i trails are not like Hawai'i Island trails where they are paved. Kaua'i trails tend to get overgrown and lost. I don't know of any trails. But undoubtedly they were there.

Section 5 Archaeological Research

5.1 Initial Archaeological Studies at Kōloa

Evidence of the importance of Kōloa to pre-contact traditional Hawaiians was indicated by Makea in a Lahainaluna Schools document produced in 1885. As stated above, Makea was able to describe fourteen *heiau* (religious structures) within the Kōloa area. Thomas Thrum was the next to document sites in the Kōloa area in his list of the *heiau* of Kaua'i (Thrum 1907). He discussed six *heiau* in the district of Kōloa, which once extended from Hanapēpē to Māhā'ulepū (Table 3). The *heiau* were Hanakalauae (Kōloa Ahupua'a), Kanehaule (inland Kōloa Ahupua'a), Kihouna (Kōloa Ahupua'a), Kanciolouma (Kōloa Ahupua'a), Weliweli (Weliweli Ahupua'a), and Waiopili (Māhā'ulepū Ahupua'a).

5.2 Archaeological Investigations in the Vicinity of the Project Area

The following is a discussion of previous archaeological investigations conducted in the vicinity of the project area (Figure 12 & Table 3). A majority of the investigations have been conducted within the *ahupua'a* of Kōloa in conjunction with the burgeoning development of the area. In contrast the archaeological record in the *ahupua'a* of Weliweli and Pā'ā is relatively sparse, due to the fact that these *ahupua'a* are relatively undeveloped and have been continuously under cultivation (historic sugar followed by modern diversified agriculture) for over a century.

The earliest systematic archaeological survey on the Island of Kaua'i was conducted by Wendell Bennett in the late 1920s. Bennett examined and recorded 202 sites on the island. According to his site location map (Figure 13; Bennett 1931:98), Sites 76, 83, 85, and 86 appear to be in the vicinity of the project area.

Table 3. Kōloa *heiau* documented by Thrum in 1907

Name	Location	Remarks
Hanakalauae	Mahaulepu, Koloa	Of large size, destroyed years ago by Fredenberg to erect cattle pens with its stones.
Kanehaule	Kaunuieie, Koloa	A paved walled enclosure of large size, destroyed some time ago: a <i>heiau</i> where rites of circumcision were performed.
Kihouna	Poipu, Koloa	A single walled <i>heiau</i> situated a short distance west of the above, 100x125 feet, enclosed on all sides by walls 4 to 6 feet high, with entry way near middle of mauka wall: seaward or makai wall 8 feet thick. A section of stones as of pavement shows nearly the whole length near makai wall and in N.E. corner is a section said to have been its altar stones.
Kanciolouma	Poipu, Koloa	Size 102x180 feet, lying nearly east and west along shore close to the beach; of three terraces, with two prominent and other room divisions at east or inner end: west end open; side walls 3 to 5 feet high; seaward wall 9 feet thick; east end wall very crooked, 11 feet thick, 6 feet high. Inner terrace is stone paved, middle terrace partly so, with flat slabs of coral or limestone.
Weliweli	Weliweli, Koloa	A paved <i>heiau</i> of large size. Pookanaka class; walls 4 feet high: portions of same said to be still standing.
Waiopili	Mahaulepu, Koloa	An oblong <i>heiau</i> of good size, walls still standing.

Reference	Type of Investigation	Findings
Hammatt et al. 1991	Archaeological Inventory Survey	Seventy-five historic properties identified including both pre- and post-contact sites. Pre-contact historic properties consisted of habitations (platforms and enclosures), agricultural features (' <i>auwai</i> , field walls, terraces, and earthen mounds) and human burials; Post-contact contact historic properties consisted of a single house platform associated with an LCA and a brick and mortar corral.
Creed et al. 1995	Archaeological Inventory Survey	Three historic properties identified, including two enclosures, a terrace, and a portion of the Kōloa-Weliweli boundary wall.
Hammatt et al. 2004	Archaeological Survey	Eight historic properties identified. Pre- and early post contact habitation structures consisted of platforms (SIHP -3757 & -3758), enclosures (SIHP -3756 & -3758), and a mound (-541); agriculture structures consisted of clearing mounds (SIHP -539 & -540). Two historic properties associated with historic transportation were also identified: SIHP -947, a segment of the Kōloa Sugar Company railroad berm; and SIHP -992, a segment of Hapa Road.
Hammatt et al. 2005	Archaeological Inventory Survey & Data Recovery	Reorganized and reanalyzed data originally collected during the 1978 ARCH study and identified 462 historic properties associated with Kōloa Field system. Documented historic properties included 316 habitation sites (131 temporary and 214 permanent), 102 agricultural sites, six storage areas, one petroglyph site, one historic crypt with no burial, a heiau, and a historic railroad berm. Radiocarbon analysis indicated that primary occupation of the study area occurred between 1400 and 1600 A.D.
Hammatt 2005	Archaeological Inventory Survey	One historic property identified: SIHP #50-30-10-3922, an earthen berm associated with a former plantation road and railroad.

Reference	Type of Investigation	Findings
Hill et al. 2005a	Archaeological Inventory Survey	Four historic properties identified: SIHP -947, segment of railroad berm attributed to the Koloa Sugar Company; SIHP -362, pre-contact temporary habitation stacked basalt enclosure; SIHP -363, pre-contact temporary habitation overhang; and SIHP No. -3920, a railroad-era rock-crushing site.
Hill et al. 2005b	Archaeological Inventory Survey	One historic property identified: SIHP #50-30-10-3926, an elevated metal irrigation flume constructed in 1902.
Hill et al. 2005c	Archaeological Inventory Survey	Six historic properties identified: SIHP -3930, a post-contact boundary wall; SIHP -3931, a pre-contact / post-contact terrace; SIHP -3932, a post-contact irrigation reservoir; SIHP -3933, a post-contact house foundation; SIHP -3934, a post-contact irrigation ditch; and SIHP -3935, a pre-contact / post-contact stacked rock wall.
Hammatt 2005	Archaeological Inventory Survey	One historic property was identified: SIHP #50-30-10-3922, an earthen berm associated with a former plantation road and railroad.
Tulchin et al. 2007	Archaeological Inventory Survey	One historic property identified: SIHP #50-30-10-5002, a post-contact stone wall.
Tulchin & Hammatt 2007	Data Recovery	Radiocarbon analysis of charcoal samples collected from SIHP -362 yielded a date range (1410AD to 1530AD) that is within the pre-contact period, suggesting that the temporary habitation enclosure was constructed and utilized by pre-contact indigenous Hawaiians.
Simonson et al. 2009	Data Recovery	Relocated 39 previously identified historic properties within the study area. Test excavations revealed that a majority of the archaeological features were utilized sporadically as temporary habitations.

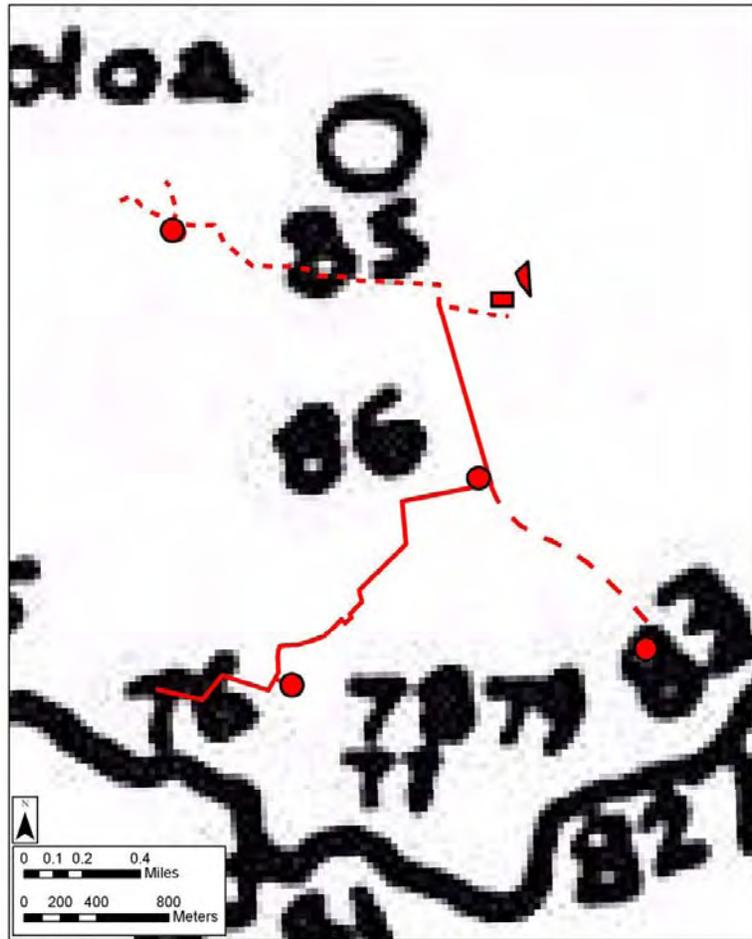


Figure 13. Portion of Bennett's 1931 index map of Kaua'i showing the approximate locations of archaeological sites in the vicinity of the project area (indicated in red) (Adapted from Bennett 1931)

Bennett's Site 76 [later designated State Inventory of Historic Properties (SIHP) #50-30-10-076] is shown on his site map (Bennett 1931: 98) as in the immediate vicinity of the southwestern portion of the project area (see Figure 13). The following is Bennett's description of Site 76: Salt pans, east of Waikomo stream along the shore" (Bennett 1931: 98) .

In these numerous salt pans, some divisions are made by a single row of flat stones on edge, others by round stones in line, still others by a double row of stones with dirt or sand filled in between for a sort of a walk.

Site 83 (SIHP #50-30-10-083), Weliweli Heiau, is located in the immediate vicinity of the southeastern tip of the project area (see Figure 13). The following is Bennett's description of Site 83 (Bennett 1931:118). "Weliweli heiau, on the shore of Weliweli section, Koloa" .

Described by Thrum as "A paved heiau of large size, pookanaka class; walls 4 feet high; portions of same to be still standing". The cane field has been cleared and the stones piled over this heiau (Bennett 1931:118).

Bennett provides the following description of Sites 85 and 86 (SIHP #50-30-10-085 & -086), located in the vicinity of the northern half of the project area (see Figure 13):

Site 85. Innumerable walls, some of them inclosures [sic] and some merely division walls and fences. In one large, walled inclosure [sic], there were three piles of stone near one end. The center one, and the largest, was 10 by 7 feet and 2 feet high. It was built up around the edge with large stones and filled with 2-inch pebbles. On each side of the structure was a 3 by 3 2-foot pile of rocks. There are some fine house sites on flat places on the lava flows, slightly leveled with small stones. House sites about 10 by 15 feet are found everywhere on the lava. The walls are of different types of construction and some have been restored for modern use. (Bennett 1931:118)

Site 86. This special house is rectangular, 25 feet wide, and 45.5 feet long, inclosed [sic] by walls 2 feet wide and about 2 feet high (Figure 14). It is divided into two sections. The south section is paved with small stone and has a terrace across the southern end. East of this section, outside the wall, is a roughly paved irregular area. The roughly paved north section is one foot lower than the south section, the walls being correspondingly higher. Outside the west wall of this house near the center is a paved platform in which is a square depression. The walls of this house site are made of double rows of stones on edge with a small stone fill between them. Coral is found in the walls. Southwest of this house site is another, with walls on three sides only, which measures 15 by 15 feet. (Bennett 1931:118)

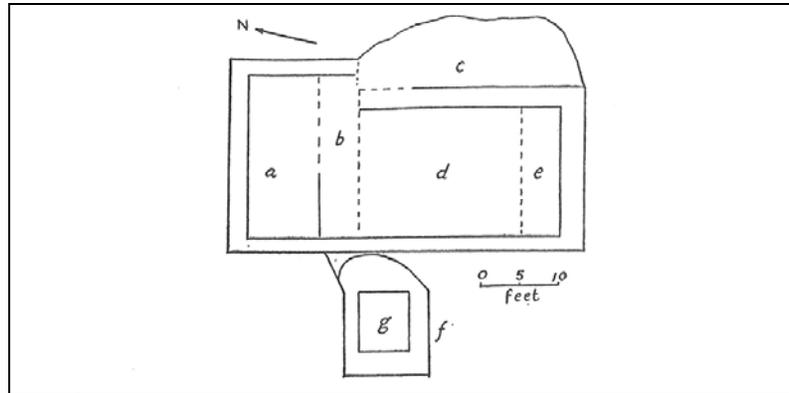


Figure 14. Plan of Koloa house site, Site 86. a, walled area 9 by 25 feet; b, terrace 5 by 25 feet, 1 foot high; c, roughly paved area; d, section 21 by 30 feet; e, terrace 5 by 21 feet, 6 inches high; f, platform 11 by 11 feet; g, depressions 7 by 7.5 feet, 1 foot deep (Adapted from Bennett 1931:121).

In 1973, Archaeological Research Center of Hawaii (ARCH) conducted an archaeological reconnaissance of a proposed cane haul road to the Koloa Mill (Palama & Stauder 1973). The proposed new section of road extended from Weliweli Road, southwestward across Po'ipū Road, connecting to an existing cane haul road. A total of 18 historic properties (SIHP #50-30-10-3173 to -3190) were identified along the southwestern portion of the study area. All observed historic properties were of pre-contact origin and consisted of habitation structures (dwelling caves, miscellaneous enclosures, and a platform) livestock enclosures, an agricultural complex ('auwai network) and a burial platform. No historic properties were documented in the vicinity of the current project area.

In 1978, ARCH conducted an archaeological survey of 460 acres for the then-proposed Kīāhuna Golf Village, located on the east side of Waikomo Stream and Po'ipū Road (Hammatt et al. 1978). A total of 583 archaeological features were identified, including 175 stone enclosures, 108 stone house platforms, 10 habitation caves, a *heiau*, extensive 'auwai networks, ponded fields, terraced plots, and mounded fields. These features suggest intensive pre-contact and early post-contact Hawaiian settlement with a focus on wet and dry land agriculture. Many of the archaeological remains identified were considered unique as they reflected "a complex Hawaiian adaptation of intensive agriculture and settlement to a dry, rocky leeward environment" (Hammatt et al. 1978).

An analysis of site location maps generated during the 1978 ARCH study, indicate 12 historic properties in the immediate vicinity of the current project area (Figure 15). Documented historic properties consist of pre-contact and early post-contact Hawaiian habitation and agricultural structures. Habitation structures consisted of stacked stone enclosures (SIHP -3455, -3457, & -3820), platforms (SIHP -3463, -3757, & -3758), and c-shapes (-3694, -3695, -3705, & -3756); agriculture structures consisted of an 'auwai network (SIHP -3823). SIHP -3756, -3757, & -3758 were recommended for preservation; no further work was recommended for the remaining historic properties identified in the vicinity of the current project area. Modern development of the area has subsequently destroyed SIHP -3455, -3457, -3462, -3820, and -3823.

In 2005, CSH returned to the Kīāhuna Golf Village to complete archaeological investigations initially conducted by ARCH in 1978 (Hammatt et al. 2005; Hammatt et al. 1978). The CSH study area consisted of approximately 400 acres, 60 acres less than the original 1978 ARCH study. CSH reorganized and reanalyzed the data originally collected during the 1978 ARCH study and identified 462 historic properties within the truncated Kīāhuna Golf Village study area. The 462 historic properties were primarily of pre-contact and/or early post-contact origin and are attributed to being a part of the Kōloa Field system. Documented historic properties included 316 habitation sites (131 temporary and 214 permanent), 102 agricultural sites, six storage areas, one petroglyph site, one historic crypt with no burial, a *heiau*, and a historic railroad berm.

The 2005 CSH investigations of the Kīāhuna Golf Village also included data recovery of 31 historic properties. The data recovery effort involved subsurface testing in the form of controlled hand excavations at the selected historic properties. Observed and collected indigenous Hawaiian artifacts consisted of primarily of lithic debitage, volcanic glass flakes, and fishing implements (bone and marine shell fish hooks as well as sinkers or various material), with a smaller occurrence of ornaments (shell, bone, and dog teeth) and a single *ulu maika* (traditional

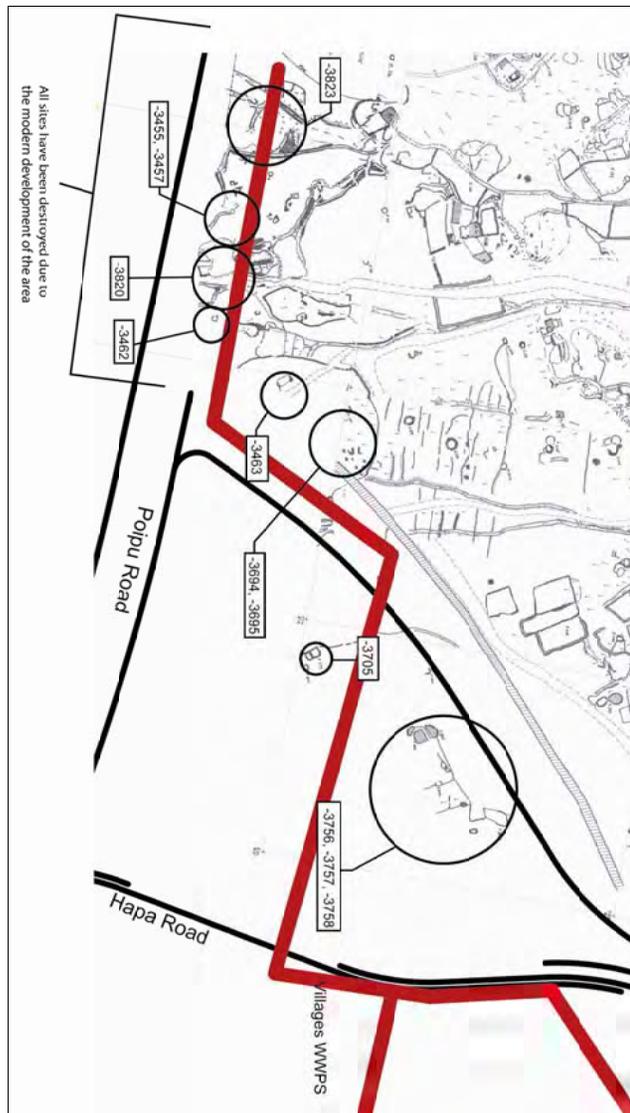
Hawaiian game stone). Radiocarbon analysis indicated that primary occupation of the study area occurred between 1400 and 1600 A.D.

In 1981, the Anthropology Club of Kaua'i Community College conducted an archaeological reconnaissance survey of the Weliweli Track which was proposed for the development of residential housing (Kikuchi 1981). Extensive bulldozing of historic origin was noted within the study area. Even with the land disturbances, both pre- and post-contact archaeological sites were observed within the study area. Pre-contact archaeological sites consisted of 'auwai remnants, terraces, and enclosures; Post contact sites consisted of a well, rock walls, a railroad causeway, and other various rock structures. No SIHP numbers were assigned to the archaeological sites observed within the study area.

In 1990, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological inventory survey for the proposed Hyatt Regency Golf Course located within coastal Pā'ā Ahupua'a (Walker & Rosendahl 1990). Eighteen historic properties were identified within the seaward portion of the study area. It is believed that historic properties that were likely present within the inland portion of the study area but were destroyed during land disturbances associated with sugar cultivation. Observed historic properties consisted of pre-contact and early post-contact habitation, boundary, and ceremonial features in the form of C-shapes, walls, platforms, terraces, and mounds. Post-contact sites consisted of agricultural clearing mounds. Human skeletal remains were noted eroding out of sand dunes along the coast but were not assigned as historic properties. No historic properties were identified in the vicinity of the current project area.

In 1991, CSH conducted an archaeological inventory survey for the proposed Po'ipulani Golf Course and residential development consisting of 160 acres located in the *makai* eastern portion of Kōloa along the Kōloa-Weliweli *ahupua'a* boundary (Hammatt et al. 1991). Although the study area was observed to have been heavily disturbed by 19th century sugar cultivation and cattle ranching, significant remnants of pre-contact indigenous Hawaiian habitation and agriculture were documented. Seventy-five historic properties were identified including both pre- and post-contact sites. Pre-contact historic properties consisted of habitations (platforms and enclosures), agricultural features ('auwai, field walls, terraces, and earthen mounds) and human burials; Post-contact historic properties consisted of a single house platform associated with an LCA and a brick and mortar corral.

An analysis of site location maps generated during the 1991 CSH study, indicate 11 historic properties in the immediate vicinity of the current project area (Figure 16). Documented historic properties consist of pre-contact and early post-contact Hawaiian habitation and agricultural structures. Habitation structures consisted of a stacked stone platforms (SIHP -909, -952), an enclosure (-954) a C-shaped terrace (-910), and a probable burial platform (-953); agriculture structures consisted of mounds (SIHP -906, -955), terraces (SIHP -948), field walls (-906, -948), and 'auwai (-972). A railroad berm segment associated with post-contact sugar cultivation (SIHP -947) was also identified in the vicinity of the current project area as well as a post-contact road (SIHP -992). SIHP -947 and -992 were recommended for preservation; data recovery was recommended for SIHP -909, -948, -952, -954, -955, and -972; and no further work was recommended for SIHP -906 and -910.



Cultural Surveys Hawai'i Job Code: KOLOA 29

Archaeological Research

Figure 15: Portion of Kahauna Golf Village study area archaeological site location map, showing historic properties in the immediate vicinity of the project area (source: adapted from Hammatt et al. 1978)

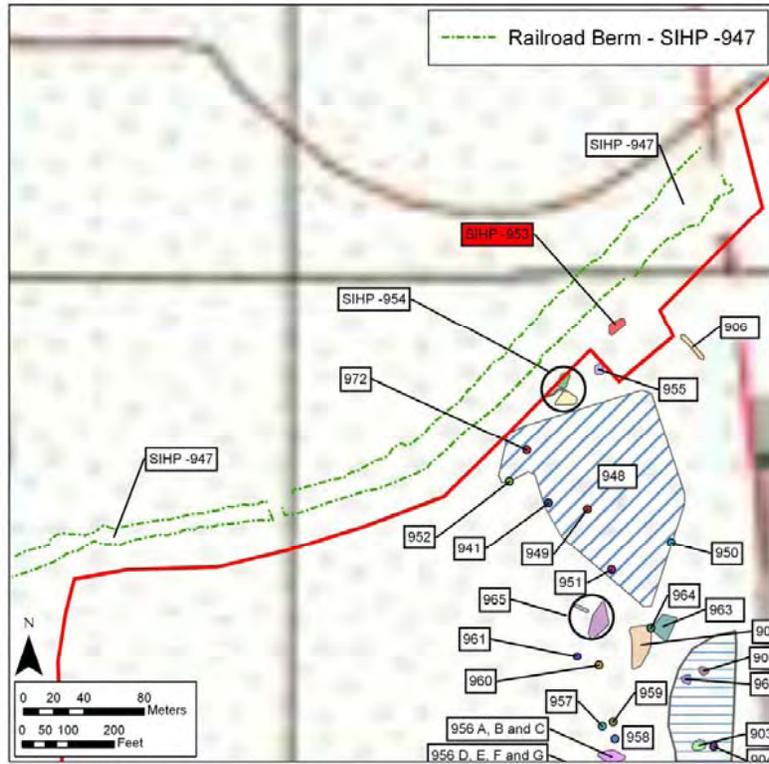


Figure 17. Portion of Po'ipulani Golf Course study area archaeological site location map, showing historic properties in the immediate vicinity of the project area (source: adapted from Simonson et al. 2009)

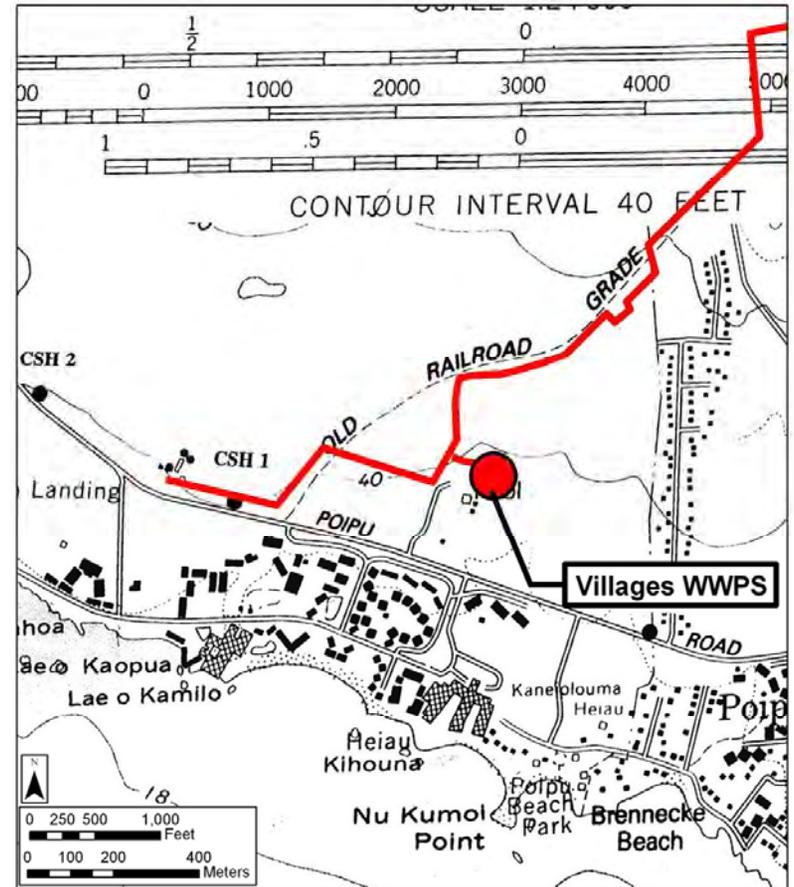


Figure 18. Creed et al. (1995) archaeological site location map, showing historic properties in the immediate vicinity of the project area (source: adapted from Creed et al. 1995)

In 2005, CSH conducted an inventory survey of an 8.633-acre parcel for the Eric A. Knudsen Trust Lands (Hill et al. 2005b). One historic property was identified: SIHP #50-30-10-3926, an elevated metal irrigation flume constructed in 1902. No further work was recommended for SIHP #50-30-10-3926.

In 2005, CSH conducted an archaeological inventory survey of a 9.348-acre parcel in Kōloa Town, located on the east bank of Waikomo Stream (Hill et al 2005c). Six historic properties were identified: SIHP -3930, a post-contact boundary wall; SIHP -3931, a pre-contact / post-contact terrace; SIHP - 3932, a post-contact irrigation reservoir; SIHP -3933, a post-contact house foundation; SIHP -3934, a post-contact irrigation ditch; and SIHP -3935, a pre-contact / post-contact stacked rock wall. SIHP -3930 to -3932 and -3935 were recommended for preservation, and SIHP -3933 and -3934 were recommended for data recovery.

In 2005, CSH conducted an archaeological inventory survey of a 8.15-acre Knudsen Trust Parcel, located just southeast of Anne Knudsen Park (Hammatt 2005). One historic property was identified: SIHP #50-30-10-3922, an earthen berm associated with a former plantation road and railroad. No further work was recommended for SIHP #50-30-10-3922.

In 2007, CSH conducted an archaeological inventory survey 10-acre Knudsen Trust Parcel, located along the *makai* edge of Weliweli Road (Tulchin et al. 2007). One historic property was identified: SIHP #50-30-10-5002, a post-contact stone wall. No further work was recommended for SIHP #50-30-10-5002.

In 2009, CSH completed the archaeological assessment fieldwork under state archaeological permit No. 09-20 issued by SHPD, per HAR Chapter 13-13-282. Missy Kamai, B.A., and Gerald Ida, B.A., conducted the fieldwork, which required 10 person-days to complete. Fieldwork took place between January 12th and 16th 2009 under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). Fieldwork involved a complete pedestrian inspection of the project area. Three historic properties were identified: State Inventory of Historic Properties (SIHP) #50-30-10-954, pre-contact habitation enclosure, terrace, and platform, SIHP #50-30-10-955, pre-contact habitation platform and SIHP #50-30-10-992, post-contact dirt road with parallel stacked stone boundary walls. Three historic properties were recommended eligible to the Hawai'i Register of Historic Places (Hawai'i Register): SIHP #50-30-10-954, pre-contact habitation enclosure, terrace, and platform, SIHP #50-30-10-955, pre-contact habitation platform and SIHP #50-30-10-992, post-contact dirt road with parallel stacked stone boundary walls.

It was recommended that a cultural resource preservation plan be prepared for the proposed -Po'ipū Regional Wastewater Reclamation Facility and Collection System project, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, address buffer zones and protective measures for SIHP #50-30-10-992 located within the southwestern portion of the project area as well as SIHP #50-30-10-947 and SIHP #50-30-10-953, which are located in the immediate vicinity of the southwestern portion of the project area. This preservation plan should detail the short and long term preservation measures that will safeguard the historic properties during project construction and subsequent use of the project area. Based on background research, it is likely that subsurface historic properties, associated with pre-contact land use, may be present within the southwestern portion of the project area. In order to mitigate the potential damage to these potential historic properties within the *makai* portion of the project area, it is recommended that project construction proceed under an archaeological monitoring program. This monitoring

program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project's non-burial archaeological deposits, should any be discovered. The specific archaeological monitoring will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division. Additionally the area proposed for the construction of the Regional WRF, located in the northern portion of the project area, is in the immediate vicinity of an old sugar mill facility. A review of historic documents indicates that this building was constructed by at least 1912 as a component of the Koloa Plantation. Due to the historic nature of these structures CSH recommends consultation with the State Historic Preservation Division Architecture Branch prior to any land disturbance associated with the construction of the proposed Regional WRF.

5.3 Archaeological Background Summary and Predictive Model

From previous archaeological studies and historic accounts it appears that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. As an extensive irrigated complex, the Kōloa Field System was used to divert the waters of the Waikomo Stream for taro, native sugar, and fish.

In the early post-contact era (1795-1880), the Kōloa Field System continued in use for foreign trade and was probably further intensified. Sweet potatoes were a main crop for the whaling and merchant ships, and the purchase of pigs, salt, oranges and other items are noted in many ship journals.

Documents of the Great Māhele show that by the mid-1800s there were still several traditional farmers within Kōloa who both lived and worked within the area. The individual claims – for both *lo'i* (wetland) and *kula* (dryland) suggest that while traditional farming of taro for subsistence was still taking place, in *kula* lands – sugar cane production for sale to the nearby sugar mill, had begun to dominate the landscape. Of the LCAs within Kōloa, several claim a *kula* planted with cane or a cane field or sugar cane garden. Several also identify cane lands as boundaries for the LCAs.

Within three years of sugar cultivation by Ladd and Company in 1835, residents in and surrounding Kōloa were quickly moving to adapt to the new economy based on the production of sugar cane. Eventually, most of inland Kōloa was planted with sugar cane and only the rockiest areas, unsuitable for cultivation, survived the dramatic changes in the landscape brought about during the early 20th century. A 1935 map of Koloa Sugar Company shows the extensive cane lands within the project area (see Figure 8).

The Koloa Sugar Company had previously purchased the *ahupua'a* of Pā'ā southeast of Kōloa town. A new mill was built in Pā'ā in 1912 about a mile from Kōloa Town, and in the immediate vicinity of the proposed Regional WRF (see Figure 10). The mill in Pā'ā was finally closed in 1996.

By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline. Although the town had established a Civic Center in 1977, the pace of tourism-driven development at the shoreline drew construction and service jobs away from the town center.

Based on background research, historic properties (i.e. archaeological sites) in the form of pre- and post-contact surface architecture may be encountered during the archaeological inventory survey of the project area. Historic research has indicated five LCAs in the vicinity of the project area, suggesting indigenous Hawaiian land use in the form of habitation and agriculture. Previous archaeological research has documented evidence of both pre- and post contact land use in the area.

Evidence of indigenous Hawaiian land use could include both habitation (platforms, enclosures, and C-shapes) and agricultural (terraces, mounds, field walls, etc.) features. Evidence of post-contact land use is likely to be associated with historic sugarcane cultivation and could include irrigation infrastructure (ditches and flumes), sugar transport infrastructure (road causeways, railroad berms, etc.), clearing mounds, and boundary walls..

It should be noted that due to the extensive sugarcane cultivation documented within the project area, mechanized land modifications associated with sugarcane cultivation has likely disturbed and/or destroyed any pre-contact historic properties that may have been present. Additionally the project area is situated primarily within in-use roadways and old cane haul roads, which have caused additional land modifications within the project area, disturbing and/or destroying historic properties. Thus the probability of encountering surface historic properties during the pedestrian inspection is low.

Section 6 Community Consultation

6.1 Overview

Throughout the course of this CIA, an effort was made to contact and consult with Hawaiian and *kama'āina* cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about cultural resources and practices specifically related to the project area in the context of Kōloa Ahupua'a. This effort was made through the use of letters, e-mails, telephone calls, and in-person interviews. The letter refers to Figure 1.1 which is not included in this CIA.

CSH sent out a letter, map and aerial photograph dated March 2, 2009, describing the project area. The text of the letter was as follows:

At the request of Wilson Okamoto Corporation, Cultural Surveys Hawai'i Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Po'ipū Regional WWP Project, located in the *ahupua'a* of Kōloa, Weliweli, and Pā'a, Kona District, Island of Kaua'i, Tax Map Key (TMK) No. (4) 2-09-001: portions of 001 and 002.

The proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility (Regional WRF) and collection system is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula.

The site proposed for the Regional WRF is approximately 3.0 acres, and other associated collection system improvements involve about 10.0 additional acres. This is based upon a 10-foot-wide easement for sewer collection lines which could be less. Therefore, the total project area is about 13.0 acres. This site consists of property located at the eastern end of Weliweli Road in Kōloa and owned by Grove Farm Company, Inc.

The wastewater collection system serving this Regional WRF's is planned to consist of the following three components and are identified in Figure 1.1:

1. Kōloa Collection System. A wastewater collection system will be constructed having a service area that includes several existing developed properties and planned developments within the Kōloa Town area. This collection system is referred to as the "Kōloa Collection System". New gravity sewer lines, and force mains would be routed within or along Kōloa Road, Waikomo Road, Weliweli Road, and across Ala Kinoiki Road in an eastbound direction to the proposed Regional WRF. A new wastewater pump stations (WWPS) would also be provided near the intersection of Waikomo Road with Weliweli Road.

2. Po'ipū Collection System. A wastewater collection system will be constructed with a service area that includes several existing developed properties and planned developments within the Po'ipū area. This collection system is referred to as the "Po'ipū Collection System," and will encompass a Po'ipū service area

extending from the planned Kukui'ula development in the west to the area of the Grand Hyatt Kaua'i Resort and Spa in the east. Proposed collection system improvements includes two new wastewater pump stations, gravity sewer lines, and force mains.

3. Eastern Collection System. A wastewater collection system will be constructed with a service area that generally includes the area of the Po'ipū Bay Golf Course situated east of the Grand Hyatt Kaua'i Resort. This collection system is referred to as the "Eastern Collection System". Collection system improvements include a new wastewater pump station, a gravity sewer line, and a force main. Effluent from the Regional WRF is planned to be used for irrigation of the Po'ipū Bay Golf Course.

The purpose of this cultural study is to assess potential impacts to cultural practices as a result of the proposed project in the Kōloa, Weliweli, and Pā'ā 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 legends and traditional uses.**
- **Referrals of *kūpuna* or elders 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.

A number of attempts (two to three) were made to contact individuals, organizations, and agencies apposite to the subject CIA. Two community members referenced as Kōloa Resident #1 and #2 chose not to be named in this CIA. They are not included in the community consultation table.

Table 5. Summary of Community Consultation

Name	Affiliation, Background	Comments
Andrade, Mackie	Kōloa <i>kama'āina</i>	CSH attempted to contact Mr. Andrade on May 5, 2009. According to his son, Mr. Andrade was off-island and unavailable for an interview.

Name	Affiliation, Background	Comments
Ayau, Edward	Hui Mālama I Na Kūpuna O Hawai'i Nei	CSH sent letter and maps on April 7, 2009. A follow-up attempt was made May 7, 2009.
Aipoalani, C. Kunane	Kaua'i-Ni'ihau Island Burial Council chairperson	CSH sent letter and maps on April 7, 2009. Subsequent contact effort was made May 5, 2009.
Blaich, Beryl	Mālama Māhā'ulepū Coordinator, Manoa Valley Heritage Foundation	On May 8, 2009, Ms. Blaich responded on behalf on the Mālama Māhā'ulepū. See Section 6.1.1 and Appendix A..
Blake, Ted	Kōloa <i>kama'āina</i>	CSH scheduled an interview appointment with Mr. Blake, but he was unable to attend.
Bukoski, Elizabeth Kalehuamakanoe	Kōloa <i>kūpuna</i>	CSH sent letter and maps on March 2, 2009. Subsequent contact effort was made to contact her family member May 15, 2009.
Burgess, Stella	Cultural Specialist at the Grand Hyatt Resort in Po'ipū	See Section 7.1.
Cataluna, Don	Kaua'i-Ni'ihau Office of Hawaiian Affairs	CSH sent letter and maps on March 2, 2009. A follow-up attempt was made April 4, 2009.
Cayan, Coochie	State Historic Preservation Department	On March 13, Ms. Cayan responded with a written response. See Section 6.1.2 and Appendix B.
Chang, David	Mālama Māhā'ulepū, raised in Kōloa	CSH sent letter and maps on March 2, 2009. Subsequent contact effort was made May 5, 2009. (See Beryl Blaich for the Mālama Māhā'ulepū response.)
Chang, Pi'ilani	Cultural Historian	CSH sent letter and maps on March 2, 2009. Letter was returned. Subsequent contact effort was made May 5, 2009.
Ching, Francis	Hawaiian Resource Specialist, Kamehameha Schools	See Section 6.2.1.

Name	Affiliation, Background	Comments
Cobb, Rowena	Cobb Realty, Kaua'i	CSH sent letter and maps on May 8, 2009. On the same day, Ms. Cobb replied that she would be on a trip but would hopefully submit a comment shortly.
Dias, David	McBryde Sugar Company worker	CSH sent letter and maps on March 2, 2009. Subsequent contact effort was made May 5, 2009.
Gage, Reginald	Board of Directors, Kaua'i Historical Society	CSH sent letter and maps on March 2, 2009. On May 6, 2009, CSH received permission to use Mr. Gage's interview for a previous CIA in the Kōloa area. See Section 4.5.2.
Harmony, Branch Kalani Kumai O Nā Ali'i Hanohano	Descendant of Pā'ā and area <i>ali'i</i> , <i>kuleana</i> owner	CSH sent letter and maps on May 9, 2009. Subsequent contact effort was made May 19, 2009 and May 21, 2009.
Holi, Wilma	Former Kaua'i representative for Hui Mālama I Nā Kūpuna o Hawai'i Nei	See Section 7.6.
Isoda, Stanley	Kōloa resident	CSH sent letter and maps April 8, 2009. On April 14, 2009, the letter was returned because the address did not have a mail receptacle. Subsequent contact effort was made May 5, 2009.
Kamai, Grace	Former Kaua'i-Ni'ihau Island Burial Council representative	CSH sent letter and maps March 2, 2009. Through her daughter Missy Kamai, she declined an interview as she is not from the project area.
Kane, Suzette	A&B Properties	CSH sent letter and maps March 2, 2009. On March 13, 2009, Ms. Kane sent a response via email saying she would provide additional contact names.
Kaohelaui'i, Billy	cultural practitioner, <i>Kanaka Maoli</i> of Hui Malama Kane I olo Uma	See Section 7.5.2.

Name	Affiliation, Background	Comments
Kaohi, Lionel	Association of Hawaiian Civic Clubs	CSH sent letter and maps March 2, 2009. On May 5, 2009, Mr. Kaohi responded saying that he would need to gather more information and would contact CSH soon to make a statement.
Kaholokula, Robbie	Kaua'i Museum	CSH sent letter and maps April 7, 2009. Subsequent contact effort was made May 5, 2009.
Kauwe, Chris	cultural practitioner, <i>Kanaka Maoli</i> of Hui Malama Kane I olo Uma	CSH conducted an interview with Chris Kauwe on May 10, 2009. However, at the time of the submittal of this report, his interview was pending approval.
Kekua, Kehaulani	Director of Kaua'i Culture & Heritage Center/ Kumu Hula	CSH conducted an interview with Kehaulani Kekua on May 10, 2009. However, at the time of the submittal of this report, her interview was pending approval.
Kimokeo, James	<i>Kanaka maoli</i> , cultural practitioner	CSH sent letter and maps April 21, 2009. Subsequent contact effort was made May 5, 2009.
Kōloa Neighborhood Center		CSH sent letter and maps May 6, 2009. On May 11, 2009 the Kōloa Neighborhood Center responded saying that they would have an assembly on May 13, 2009 and that they would contact CSH if any <i>kūpuna</i> were interested in participating. However, no contact with CSH was made.
Kruse, John	Kaua'i-Ni'ihau Island Burial Council chairperson	CSH sent letter and maps March 2, 2009. On April 8, Mr. Kruse responded via email referring Stella Burgess and Tom Shigemoto to CSH.
McMahon, Nancy	SHPD	CSH sent letter and maps March 2, 2009. Subsequent contact effort was made April 7, 2009. On April 8, Ms. McMahon responded via email saying she would refer the matter to Phyllis "Coochie" Cayan and Pua Aiu of the SHPD.

Name	Affiliation, Background	Comments
Medeiros, Bernard	Rancher in Kōloa	CSH sent letter and maps March 2, 2009. On May 11, 2009 Mr. Medeiros declined to participate, saying he was unfamiliar with the project area as he raised cattle on the west side of Po'ipū Road.
Medeiros, Gabriel	Kōloa resident	CSH sent letter and maps March 2, 2009. The letter was returned March 18, 2009. Subsequent contact effort was made May 5, 2009.
Muraoka, Satoshi	Kōloa resident	CSH sent letter and maps April 8, 2009. Subsequent contact effort was made May 5, 2009.
Muraoka, Ikito	Resident of Kōloa	CSH sent letter and maps April 8, 2009. On May 11, 2009, Mr. Muraoka stated that he was unable to participate in the project as he had a trip scheduled during the interview period.
Nāmu'o, Clyde	OHA	See Section 6.1.3 and Appendix C.
Perry, Warren	Royal Order of Kamehameha, Kaumalii Chapter no. 3	CSH sent letter and maps on March 2, 2009. On April 9, 2009, CSH received permission to use Mr. Perry's interview for a previous CIA in the Kōloa area and will include his interview in the final draft.
Oi, Tommy	Department of Land and Natural Resources, Kaua'i	See Section 7.2.
Rogers, Lucille	Ke Ola Pono No Nā Kūpuna Alu Like Program Specialist	CSH sent letter and maps March 2, 2009. Subsequent contact effort was made May 5, 2009.
Rowe, Rupert	cultural practitioner, <i>Kanaka Maoli</i> of Hui Malama Kane I olo Uma	See Section 7.5.3.
Say, Barbara	Kaua'i-Ni'ihau Island Burial council member	CSH sent letter and maps April 7 2009. Subsequent contact effort was made May 5, 2009.

Name	Affiliation, Background	Comments
Shigemoto, Tom	Kaua'i-Ni'ihau Island Burial Council member, A&B Properties	CSJH sent letter and maps March 2, 2009. On April 7, 2009 via email, Mr. Shigemoto kindly referred CSH to Walter Souza, Stanley Isoda, Jenichi Shigematsu, Satoshi Muraoka, Ikito Muraoka, Wayne Tanaka, Bruce Sakimae, Allan Smith and Gabriel Medeiros.
Shigematsu, Jenichi	Kōloa resident	CSH sent letter and maps April 8 2009. On April 14, 2009, the letter was returned because the address did not have a mail receptacle. Subsequent contact effort was made May 5, 2009.
Smith, Allan	Kōloa resident	CSH sent letter and maps April 8, 2009. Subsequent contact effort was made May 5 and May 11, 2009.
Souza, Walter	Kōloa resident	CSH sent letter and maps April 8 2009. On April 14, 2009, the letter was returned because the address did not have a mail receptacle. Subsequent contact effort was made May 5, 2009.
Summers, Molly Ka'imiloa	Kaua'i Community College Hawaiian Language professor	CSH sent letter and maps March 2, 2009. Subsequent contact efforts were made April 7 and May 5, 2009.
Tanaka, Wayne	Kōloa resident	CSH sent letter and maps April 8 2009. On April 14, 2009, the letter was returned because the address did not have a mail receptacle. Subsequent contact effort was made May 5, 2009.
Torres, Johnny	Kōloa resident	CSH sent letter and maps March 2, 2009. Subsequent contact effort was made May 5, 2009.
Tsuchiya, Rick	KHPRC	CSH sent letter and maps March 2, 2009. Mr. Tsuchiya invited CSH to attend the May 7, 2009 KHPRC meeting. The KHPRC found the community contact list sufficient and provided no referrals.

Name	Affiliation, Background	Comments
Wichman, Randy	KHPRC	See Section 7.5.1.
Yagodich, Darrell	Department of Hawaiian Homelands	CSH sent letter and maps March 2, 2009. On April 7, 2009, Mr. Yagodich replied via email with the following: "Thank you for sharing the information. We have no property or homestead community in the vicinity of the proposed facility. We have no comments to offer."

6.1.1 Mālama Māhā'ulepū

CSH contacted Mālama Māhā'ulepū coordinator Beryl Blaich on March 2, 2009. Mālama Māhā'ulepū is a grassroots group determined to preserve Māhā'ulepū, a heritage *ahupua'a* (watershed) about 2,700 acres from the peak of Mt. Hā'upu that flows through the *ahupua'a* into the ocean, which neighbors the project area. In a written response sent to CSH May 8, 2009, (see Appendix A), Ms. Blaich states the historic value of Kōloa Sugar Mill, built in 1913, as well as graveled dirt haul cane roads, many of which were haul cane rail routes until about 1954. She recommends that the mill, ideally, "will not be demolished but reused and no future structure near it will obscure or dominate it."

She also speaks about the *kuleana* records of the project area. She says, "As you no doubt recognize several of the Pā'ā ahupua'a parcels were located in 'marsh' which became Waita- the largest reservoir in Hawai'i. It seems that several of the applicants did not receive grants allegedly because their claims, written by the school teacher (public school located at Māhā'ulepū) named Kekele, were rejected in Honolulu as Governor Kanoa said they were 'soiled and improperly written.'"

She also refers CSH to Kalani Kumai O Nā Ali'i Hanohano, *kūpuna* Rupert Rowe and Leonara Dizol Kaiakamaile.

Ms. Blaich is concerned about cultural practices in area, which she says have been limited in recent years. "Since the plantation closed, the community has lost access to Waita Reservoir where there are now commercial operations, as well as to the cane haul road along the mill, which the community traditionally used to go to Māhā'ulepū, and to the valleys and ridges where pigs were hunted and people did gather plants." She also goes on speak about the restrictions to *mauka* access and pigs as a problem with the native plant restoration project by David and Linda Burney. She says she doesn't know if the pigs are also causing a problem for the GMO corn operation starting in Pā'ā and Māhā'ulepū. Another community concern she shares is that although landowners and leasees are concerned about liability, vandalism and already commit money to management of the area, community members resent their exclusion to formerly used areas.

She also shares Mālama Māhā'ulepū's concerns about negative visual and environmental impacts to Pu'u Wanawana, Pu'u Hunihuni and Pu'uhi Reservoir. She cites the 1992 State Land

Use District Boundary Review (see Appendix A), in which the Office of State Planning proposed to redesignate 1,517 acres of the Māhā'ulepū coastal area from agricultural to conservation, which included the aforementioned *pu'u* and reservoir. She also expresses concern with possible environmental impact that two of the craters, after the winter rainy season, hold intermittent lakes that are frequented by migratory water birds. She goes on to add that the 157 acres *mauka* (north and west) of Waitā Reservoir were proposed to be added to the conservation district since the reservoir was "designated as a primary water bird habitat by Federal and State agencies and is used by all four endangered water birds in the state as well as the black crowned night heron and migratory shorebirds and ducks." She is concerned that the wastewater plant will cause the birds of the area to become endangered, and worries, "whether the plant's infiltration basin will attract water birds and is that all dangerous?" Ms. Blaich also is concerned about how the project will affect the viewplane. She says, "we are concerned about the visual impact of the proposed eastern pump station and the crater pump station on these puu, especially looking mauka from the coast to the mill."

There are also land use planning concerns, namely, that the Kōloa-Po'ipu-Kalāheo development plan is "over due to be updated," according to Ms. Blaich. There are several diverse uses proposed for the mill area. She states that there "is a need for [a] master plan for this important area as well as for the development plan [to] update Koloa's undeveloped lands."

6.1.2 State Historic Preservation Division

CSH contacted Phyllis "Coochie" Cayan, History and Culture Branch Chief of SHPD, on March 3, 2009. In a written response sent to CSH May 13, 2009, (see Appendix B), Ms. Cayan refers Nancy McMahon, SHPD archaeologist who lives in Kōloa and is familiar with burial and sites in the area. Also referred to CSH is the Kaua'i Museum, Nā Kūpuna at Alu Like (Līhu'e Unit), Kaua'i-Ni'ihau Island Burial Council members John Kruse, Aunty Barbara Say and chairman C. Kunane Aipoalani. She encouraged CSH to "talk-story" with or to get referrals from those who know of traditional and cultural practices in the area.

6.1.3 Office of Hawaiian Affairs (OHA)

CSH contacted Clyde Nāmu'o, Administrator of the Office of Hawaiian Affairs, on March 2, 2009. In a written response sent to CSH on April 20, 2009 (Appendix C), Mr. Nāmu'o states, "Numerous cultural sites including, but not limited to heiau complexes and fishing shrines are situated within the assessment area and community groups are actively working to preserve these cultural sites for future generations." Mr. Nāmu'o also recommends CSH consult with Rupert Rowe, James Kimokeo, Billy Ka'ohelaui'i, Randy Wichman and Chris Kauwe.

6.2 Brief Responses from Project Participants

6.2.1 Francis Ching

On May 6, 2009, CSH conducted a phone interview with Mr. Francis Ching, Hawaiian Resource Specialist for Kamehameha Schools. Mr. Ching was born in Kalapakī, Puna, Kaua'i in 1937. His father moved the family from Port Allen ('Ele'ele, Kona, Kaua'i) to Kalāheo, Kona, Kaua'i in 1957. He spent his childhood on Kaua'i and O'ahu, and his summers on Kaua'i while

he was in the Navy, and attending the University of Hawai'i. His father moved to Kaua'i in 1936 because his mother's family lived on Kaua'i. His father was at one time the Personnel Manager, then the Trucking Department Manager for Kaua'i Terminals/Kaua'i Commercial Co., then the General Manager for Kaua'i Commercial, which allowed his family access to areas unseen by most of the public. Mr. Ching also conducted archaeological work on Kaua'i for many years. He has seen the island change over time. He "saw many cultural sites when [he] was growing up by my grandfather Henry Ka'iwi Aki."

When asked if there were any cultural properties in the project area, Mr. Ching stated that most of the project area is on sugar cane lands that were previously harrowed. He states that the project is following areas that have been previously disturbed and it's most likely that very few sites will be found.

Mr. Ching also referred to several different archaeological testing sites he conducted in the area during the 1970's and other sensitive areas in which sites were found. The first is the Old Cane Road near the coast in front of Fort Elizabeth, Makaweli, Kaua'i on the banks of the Waimea River. During that testing, sites were found in areas that were not covered by sugar cane planting. Those sites were located in the area not utilized by cane cultivation. The cultural layers were found close to the surface probably as a result of ground leveling in the area. He also recalls conducting an archaeological inventory survey in Weliweli, in back of Weliweli track, where some things were found. He also mentioned the railroad berm. He says that in the past, when the berm was being laid, the rocks from the cultural sites along the way were used to construct the berm, so he believes very few sites will be discovered. He also refers to the lava tubes, as potential sites, but he acknowledges that the project area is not likely to include the lava tubes. He also said that there would possibly be some sites near Kōloa town, but he suspects that modern homes were built upon whatever was previously there. Mr. Ching adds that Kōloa Road was built on the main system. Most Cane Haul roads in the project areas did not disturb the ground. They were built over non-harrowed ground. The sugarcane train tracks were also laid over the ground. Therefore, if the project runs across non-harrowed ground, cultural or historic properties may be found.

Mr. Ching believes that very few burials will be found, but if they are, he says they will be easily identified by looking closely at the arrangements of stones. He says the walls in burials are nicely lined up, and stones that are not lined up are probably sweet potato mounds.

Mr. Ching suggests putting down a few test pits will clear the area for cultural or historic properties. He recommends a cultural monitor be present during construction. He also says that there will be "no surprises- either you see the strata or not." If something is found, it will not be on previously disturbed land.

When asked if he there were any other pertinent cultural sites or practices in the project area, he says, "I do not see any pertinent regards to cultural sites and practices in the area impacted by the proposed project." When asked if he had any other further recommendations for the project, he stated, "Standard archaeological procedures should be followed as well as common sense."

Section 7 Kama'āina "Talk Story" Interviews

Kama'āina and *kūpuna* with knowledge of Kōloa, Weliweli, and Pā'ā Ahupua'a and the proposed project area were contacted for a more in-depth contribution to this assessment. The approach of CSH to cultural impact studies provides these community contacts an opportunity to review transcriptions and/or interview notes and to make any corrections, deletions or additions to the substance of their testimony. For this CIA, eight people generously shared their *mana'o* (thoughts, ideas, theories) in face-to-face, talk story interviews.

7.1 Stella Burgess

CSH interviewed Mrs. Stella Burgess, Cultural Specialist at the Grand Hyatt Hotel on Friday, May 15, 2009. She has done extensive research on *kuleana* lands pertaining to her family. She was born and raised in Kalahe'a. Her grandfather's mother came from Kōloa and her grandfather's father was from Kilauea, but her grandfather moved to Pakala on the west side of Kaua'i. The following is a summary of her interview:

Mrs. Burgess has researched a *kuleana* land holder, Mika [Kailihakuma], who was awarded LCA 6667 during the Māhele. According to LCA records, at the time of the Māhele, he grew Irish potatoes, oranges, bittermelon, gourds and yams. There was a wall and a fence on his property and a government road ran through his property. He did not live here, but lived in Māhā'ulepū. The area of the LCA was called Makapa'ala. From the Mika holdings, the property ended up in Mrs. Burgess's 'ohana (family). That section explained that there was a *heiau* to Laka. *Pili* grass was often offered at the *heiau*. Also in the Makapa'ala area was the home of a family named Nakai or Naka'iwelo, who were canoe builders. She says that there may be burials in the area because "they always buried near the *hale* (house)."

Along Hapa Road, there were some individual homes there as well. They would grow 'uala (sweet potato, *Ipomoea batatas*) and sugar cane in their time period. The entire area was known as Pa'uolaka, "the skirt of Laka." The area was not dedicated for hula, but for agriculture. Laka was a duality god- male and female, 500 acres were dedicated for Laka during the time of Mānokalanipō, who was responsible for the resurgence of agriculture in the south shore area.

According to Mrs. Burgess, Kukonaala'a was a chief, descended from Tahitians, who settled in Kaua'i in the 15th century. His brother Ahukiniāla'a settled in the area of Ahukini. Kukonaala'a was probably the origin of the name for the Kona District of Kaua'i. In the 15th century Kukonaala'a fought the first large battle of the Hawaiian islands, which took place in the project area. The biggest battle happened at Māhā'ulepū. Kukonaala'a battled every island chief and won, 300 years before Kamehameha conquered the Hawaiian Islands. In the project area, and neighboring Māhā'ulepū and Makwehi, bones that are found are usually from this large battle. Many believe that the *īwi* found in the area are from the battle with Kamehameha, but they are actually from Kukonaala'a's battles. Māhā'ulepū and other neighboring areas are named after parts of a canoe because those who won the battles came in on canoes. Once the area was conquered, the name was changed.

When Mrs. Burgess was young, she saw underground caverns or volcanic tubes near the Kōloa Neighborhood Center area with water flowing through them. She says that when it rains

very hard, the rain goes into the caverns and spouts above ground. She warns that care needs to be taken during the construction of that area.

She explained that the Battle of Palena and Palilia took place near Waitā Reservoir and a little below it in the 16th century. There were many *lehua* (*Metrosideros macropus*) trees and the ground was soft and spongy. When Palila's father was fighting the battle, Palila saw that the enemies were hiding in the trees. He had the men cut down the *lehua* trees so the *lehua* became a part of the soil, and the soil became very soft and spongy. This is how the soil became the way it is today. In modern times, they attempted to plant sugarcane in this area, because when they burned the sugarcane, the ground burned too because of the fossil fuels in the soil.

CSH asked if she knew the meaning of Pu'uwanawana, and Mrs. Burgess knows no story attached to the hill. "*Wanawana*" could mean "much spikiness" after the *wanawana* sea urchin. She says that when the missionaries brought Christianity, many of the legends and the *kaona* (hidden meanings) of words were lost. Pu'uwanawana was the last active crater of the 28 cinder cones in the Kōloa area. As far as she knows, Pu'uwanawana is a natural formation. She says that the Ainako house lot was near there and they were a family of permanent fishermen next to the Grand Hyatt Resort.

When asked about the place name of Pu'uhi Reservoir, Mrs. Burgess said that "*pu'u*" refers to a hole, pocket or well. She believes that Pu'uhi was a name given to the Reservoir by the sugar cane companies. Often times many place names are named "one, two, three, four" by sugar companies and were not named so by native Hawaiians. She also says that native Hawaiians did not own water and although they would divert water, it would always end up into a stream or ocean. There were no enclosures of water, as Pu'uhi Reservoir is today. There is no record of "Pu'uhi" in the Land Commission Awards that she has researched.

She also adds that, after the Māhele many place names changed to the names of the people who lived in the area. Often times, LCA testimony was given by one person who supported many.

The Po'ipū area has changed from a small section to a much larger area. She relates that many south shore names in Kaua'i include "*po*" from Kukonaala'a's son Mānokalanipō's journeys to the south shore. The true area of Po'ipū was from the fence at Waiohai to half of where they call "Baby Pond" today until you get to the main road. There was never a Po'ipū Beach. It was called Kahuolenaopua'a, possibly relating to either the pigs on land or a fish called *pua'a*. It may also be a reference to Kamapua'a who played in the back of the ridge of the *ahupua'a* with Pele.

In this cane field, there are many crevices, tunnels and volcanic tubes in the area as well.

Waikomo Stream may have been ten times a big as it is now and had many *auwai* extensions. There was an *auwai* where the Sheraton Resort is now and went to Kīahuna.

Many ancient Hawaiians had temporary shelters in the area. The families would have a *kuleana* (property) *mauka* (inland) and another *makai* (towards the sea) and go back and forth. She gives the example of a family who are *hulu* (feather) catchers and live at their *mauka kuleana*, but when they are tending to their *kalo* (*Colocasia esculenta*) for one or two months, they live in a temporary shelter. This is how they were able to barter and trade for salt and other items. Evidence of *kalo* farming in the area is found with a 700-year-old *poi* pounder came from the area of the Grand Hyatt Hotel (Hi'inui) site which Mrs. Burgess owns (see Figure 19). Mrs.

Burgess also mentioned that fish hooks were found further inland which supports the idea that the ancient Hawaiians would live in *mauka* and *makai* properties.

She said that the Maulili Heiau has not been found, but may be in the project area. She says that it was a sacrificial *heiau* and there was also one in Māhā'ulepū, which is not in the project area.

Mrs. Burgess stated that further north of the project area, in the valley, the ancient Hawaiians would grow sugar cane. Sugar cane was used it for medicinal purposes and for tassels for arrows. *Lehua* (which also grew near the ocean), *pili* grass and medicinal herbs were also grown. Mrs. Burgess was taught that *noni* (*Morinda citrifolia*), was eaten as fruit. They also had *kukui* (*Aleurites moluccana*) for the fishermen as well as breadfruit. *Uhaloa* (*Waltheria indica* var. *Americana*) was possibly grown by individual families in *auwai*, but probably did not grow in abundance as it does on the west side of Kaua'i. *Pōpolo* (*Solanum nigrum*), which was eaten in a salad and also used medicinally was grown everywhere.

She says that it is likely that *iwi kūpuna* will be found in Kukui'ula and Kōloa, which is full of underground lava tubes. She recommends that if any cultural historic properties, such as *iwi kūpuna* are found, the construction should stop. She hopes that the project proponent will be sensitive toward cultural issues and the project will keep "above board" and if anything is found, it should be reported. She recommends for a special place to be designated for the *iwi kūpuna* and they should be put back as quickly as possible not to create another Wal-Mart situation. She would like to be contacted if any *iwi kūpuna* or other cultural historic properties are found.

When asked if any cultural practices would be affected by this development, she sites that the project area is too far from the coast to impact fishing. She knows of no one who currently gathers any plants in the area as people do not know what pesticides are being sprayed where. Many people grow and gather their own plants and herbs on their own properties. She does say that flowers are often gathered in the project area, specifically *'ilima* (*Sida*) from the Pu'uwanawana area to the former cane fields. There is also *hina* in the neighboring Māhā'ulepū area, but none in the project area as it needs salt and lime rock to grow. She makes leis out of *hina* (possibly *Heliotropium anomalum*), which is a baby cactus, in a circle, *poepoe* (round, circular) fashion. *Hina* is also used medicinally for cleansing, but if overused, could cause death. There may also be a *lā'au* (medicinal) heiau in the area as it lines up with Kāne heiau on Wai'ale'ale, although she can not verify it.

According to her research with the Land Commission Award records from 1948, Kōloa is only a part of the original place name of Kōloakomohana. The area was a place where one could see the sun rise and set. When asked if she knew of any *'ōlelo no'eau* in the project area, she could not think of any. She contacted Robert Bukoski to ask if he knew of chants about Kukona, Mānokalanipō and Palila. However, Mr. Bukoski did not know of any.

When asked for her thoughts on the proposed project, she said that there are many pros as well as cons. The positive aspects of the project include that there will be a place to put the sewage, as well as accommodate the new developments in the area. She says that in the past, sewage has been pumped into caverns. The negative aspects of the project are the possible impacts to historic cultural properties. She says that that these impacts can be mitigated by close monitoring of the area while the construction is in progress. She anticipates that when the project

starts, trouble can be avoided if everyone is mindful of each other. She recommends the developers ask for help when dealing with cultural issues. She advises the project proponents to consult with the community in general and in particular with Grace Bacle, whose family comes from the South Shore.



Figure 19. 700-year-old Poi pounder found in the Hi'inui area.

7.2 Tommy Oi

Mr. Tommy Oi was born in Honolulu and moved to Līhu'e in 1969. Mr. Oi has been working for the DLNR since 2003 and care of all the leased agricultural lands on Kaua'i. Today these systems are made better than before.

When asked about his knowledge and concerns with the proposed project Mr. Oi responded:

DLNR only has one pasture in the project area the rest is all privately owned land. A lot of this wastewater stuff is based on the health regulations before everybody had cesspool, but with different health regulation and the development of this area capacity is needed.

In the past I used to work for a civil engineering firm a long time ago. In this area over here (pointing to the map in the Po'ipū and Kōloa areas) there are a lot of lava tubes, so when they used take care of a cesspool a lot of them would hit lava tubes so you don't know where the waste is going, whether it is going into the ocean. This would be a better way to contain all your sewage and waste. You are not contaminating every place else. Most all the waste will be contained. I know that they can recycle the water. A lot of that water can be used by the community and for irrigation. It is just something that is going to help the area so I don't have any concerns.

When asked about direct drilling impacting burials, archaeological sites and cultural practices Mr. Oi mentioned:

I am not going to say no. I am not sure on how they do the drilling, but again I say I cannot say. The only way you can find the cultural stuff, but then it is going to be hard because they will be drilling. You don't know what is under there. Before when they dig at least you have some way of observing what is there.

I know places maybe 10 years or 20 years ago in Los Angeles they refine their sewage water and they are drinking. That way you are not depleting the resources even if you are using for irrigation. I know of only one or two waste water plants in Kōloa. The only reason I know about two when I was working for the civil engineering firm we had to develop in that area.

7.3 Kōloa Resident #1

CSH interviewed Kōloa Resident #1 on May 14, 2009 at his home in Kōloa. Born and raised in Kōloa, he feels that he needs to say something because it is not in the nature of local residents to state their opinion in matters regarding development. In the many years past, if Kōloa residents had spoken up about overdevelopment of Kōloa and Po'ipū the development would not have occurred to this magnitude. He was very active in all of the youth sports in Kōloa for many years.

As a child, he recalls fishing in the Waitā Reservoir and the plantation ditches for bass, tilapia, *koi* and frogs. He also recalls pig hunting near Waitā Reservoir, although he himself only went once. Currently there is no access to Waitā Reservoir, and he stated that he would like there to be access for the children today to have a chance to fish there. He also would gather mountain apples and the purple "choke plum" in the area when he was a child.

With regard to the proposed Kōloa-Po'ipū Wastewater Treatment Facility and Collection System, he is concerned that many homes in the Kōloa Town area would be affected because it is very close to the subdivision in Kōloa Town. He is concerned about the smell that the Pump Station will generate.

He is also concerned that the Kōloa residents will be forced to connect to the sewer line. He refers to a situation in Līhu'e in which residents had to connect to the sewer line and spend a lot of money. He states that he and many community members are happy with the cesspools that they currently have and find the proposed project unnecessary. He says that the soil in Kōloa is very porous and rocky and absorbs the waste and pumping the cesspool is rarely needed. He said

perhaps if HOH Utilities covered the installation fee and if the service cost only \$25 a month, he may consider it, but thinks those conditions unlikely and generally finds the project unnecessary. He sees the Kōloa branch of the system being built for the Kōloa Creekside Subdivision, which is currently in the planning stage. The Kōloa Pump Station is directly across the street from the Kōloa Creekside site. He also believes that the sewer system may be being built for a shopping center going up near the post office.

He mentions that there are underground lava tubes in the Kōloa area and that some of his neighbors have hit the lava tubes when digging their cesspools.

He also expresses frustration with the overall development in the Kōloa-Po'ipū area. When asked if there were any historic sites to preserve, he replied, "How can we preserve something if we don't own the land?" He sees this project as "opening the door to more development" in the area. He believes that this project will support future development in the Kōloa-Po'ipū area. With regard to the shopping center being built in Kōloa, he feels that there are enough businesses, which have enough competition amongst themselves. He is concerned for local businesses such as Big Save, Kukui'ula Store area, and Sueoka's. Their profits are put back into the community, unlike national companies, such as Wal-Mart, which are cheap but do not take care of their workers, and do not return anything to the community.

He also mentioned that although the new developments are creating new jobs, many of those jobs are being given to those not local to the area. A lot of the younger generations of local people do not have the same educational background as their counterparts from the mainland. "A lot of the residents in the new subdivisions that are coming up are from the mainland. I'm sure that all of them are not 65 years and up and retired. They will compete with local people for jobs. Kaua'i High Schools are graduating 1,000 kids a year and very few of them are going to college. How are the ones that didn't go to college and stayed home compete with newcomers from the mainland for jobs?"

He says that the plantation would have taken care of these people today, but there is no plantation. He says that with the recent developments in Kōloa and Po'ipū, everyone thought for all these years these lands were zoned as "agricultural" because they saw cows and *koa* trees on the land. Many people did not know that these lands had been rezoned a long time ago. He asks, "Were the developers and landowners paying a higher tax on these zones? What is fair?" He mentions that although the landowners have done a lot for the community, he would hope that they would not maximize their profits and keep the land under agricultural zoning.

Related to the new development in the area, he is concerned about the public right of way near Spouting Horn. The landowner is blocking access to the area, forcing community members to walk from Kukui'ula Harbor, over rocks and through people's private homes, to Spouting Horn. He would like to see an easier right of way for community access.

He recommends the project proponent hold public meetings and update the community about the proposed project. He heard that the Kōloa Community Association (KCA) has approved the project, but many KCA members do not live in the affected area and that the proposed project may not affect them directly. "If it was in their backyard maybe their decision would have been different if they lived right in the Kōloa Town area."

He also states that the project seems to be moving forward despite the fact that the Cultural Impact Assessment (CIA) was not complete. He feels that the community's input is not valued as he has not heard about the project except through the community consultation for the CIA. He referred to the Hawai'i Super Ferry, in which the Environmental Impact Statement (EIS) was completed after the company had already begun to operate and the harbor improvements were made. Act 2, which allowed the Super Ferry to operate without an EIS, was found unconstitutional by the Supreme Court. Therefore, he is wary that this project, although not under Act 2, is similarly proceeding without following the legal process. With regard to the legal issue of the EIS, he says that someone will probably contest this process if not followed correctly.

From his travels abroad in the Army, he has seen that no matter where it is in the world, "if it's a beautiful place, it will be overrun and money and politics will prevail." He hopes that law makers will have long-term visions for the community and will create laws to protect Hawai'i and its residents. He hopes that the lawmakers and developers will do what is right.

7.4 Kōloa Resident #2

CSH interviewed Kōloa Resident #2 at a coffee shop in Līhu'e on May 15, 2009. Born and raised in Kōloa, she is involved with community groups such as Malama Māhā'ulepū and the Kōloa Community Association.

She discussed the concerns of her family and other community members. After Hurricane 'Iniki, many residents had to redo their cesspools and find the system unnecessary. They also do not want to pay extra money for the new proposed system. Her family and community members are also concerned about the project proponent laying pipes through their backyards and properties.

She is also concerned that the Bypass Road is sinking because it was built on coral flats. She says that to her knowledge no one has surveyed the underground caves. She asks how far and expansive the drilling will be under the Bypass Road and is concerned about its effect. She says that the whole area is sensitive and may yield cultural historic properties, because they may inadvertently dig into the underground caves. She says also that the project area may be on land that's already been "touched," thus there may already be irreparable damage to cultural/historic properties in the area. The bypass road is sinking because they had to build the road quickly and cheaply to link the road to Po'ipū. She shares that many of the burial sites between Kōloa and Po'ipū, where current projects are being built, were not recorded.

She mentions that there are pockets of native plants along the side of the road, primarily on the Māhā'ulepū side of the project area where there is *anapanapa (Columbrina asiatica)*.

When asked about the Kōloa Sugar Mill, she stated that she was hoping the Mill could be used for another purpose. The original Mill in town has been changed, but no one seems to have a problem with it. She says that she hopes that there will be no odor or noise from the facility at the Mill. She is also hoping that the project proponent will take responsibility and clear the old cars and other garbage in the area, to make the area more presentable, instead of just being a "brownfield."

She also shared her concerns about the long-term impacts to the community this project may bring with it. She stated that new infrastructure (sewer system, new water system, etc) may mean that a significant zoning change or large development project is anticipated and thus, foresees this project supporting more (new) development in the future. Her family expressed frustration with the ongoing development of the Kōloa-Po'ipū area. Kukui'ula especially brought out a lot of negative feelings from the community. She believes that this project will raise questions regarding new developments in addition to Kukui'ula, Kōloa Creekside, and the shopping center in Kōloa that stirred a lot of controversy. She asks who the proposed wastewater system will service. She recommends the project proponent conduct meetings in the community to clarify this question as well as to listen to and take into account the community's concerns.

7.5 Mr. Randy Wichman, Mr. Billy Kaohelaui'i, and Mr. Rupert Puni Rowe

On May 12, 2003, Mr. Wichman, Mr. Kaohelaui'i, and Mr. Rowe most graciously hosted Cultural Surveys Hawai'i for an interview at Mr. Kaohelaui'i's *kuleana* lands where he was raised. The scene for our interview was set on the *lānai* (porch) of Mr. Kaohelaui'i's home a peaceful home amongst the modern day development which is now Po'ipū. The evening began with talking story and catching up on past projects conducted by CSH in Kōloa followed by dinner Mr. Wichman, Mr. Kaohelaui'i, and Mr. Rowe graciously shared their knowledge of the lands of Kōloa, Po'ipū, and the present project areas.

7.5.1 Mr. Randy Wichman

Mr. Randy Wichman is the President of the Kaua'i Historical Society and serves as the Chairperson for the Kaua'i Historic Review Commission. Mr. Wichman was born to Ms. Loretta 'Ainoa Brandt daughter of Lilinauele Hart and Herman Brandt of Kōloa, Kaua'i.

CSH asked Mr. Wichman to share his association with Kōloa and the proposed project area:

My name is Randy Wichman. My mother is Loretta Brandt and my grandmother is Gladys 'Ainoa Brandt. My great-great-grandmother is Lilinauele Hart who married Herman Brandt. They were here at Kōloa Sugar 1835. My whole family from that side is buried here in Kōloa. I feel a responsibility to what is going here in Kōloa. I feel a *kuleana* (responsibility).

We are here to discuss the reclamation sewage treatment for Kōloa and the five out stations. My understanding of the project is 90 percent of it, I think is going through old plantation cane lands and 10 percent has true impact. As you start to identify the central core around Kōloa Mill it is on the National Register as a historic landmark. The bug-gas building is intended to be used for the main treatment settling plan. The water reclamation out of that is for irrigation. I don't think it is going to be potable, but the number one problem there is that by doing this, whether it is going to affect this national historic registry status and that is yet to be determined. I think they are looking into it right now. The main line coming in from the center of Kōloa to the Kōloa Mill may not be so problematic.

The line coming from Kōloa Mill down towards Pu'u Wanawana and working off towards the Knudsen Property and ending up through Hapa Road and especially along the Knudsen property- Hapa Road sector there are some issues there.

The pathway going through the different *pu'u* or hills I think needs to be looked at a lot closer because there is the trails that are linking all through there. It would be curious to see what is up with that. I think that right now there are 14 waste water treatment plans around Kōloa this will illuminate all of it and provide the sewage maintenance in the long term; right now it is all injection wells. They are pumping all the sewage underground and that will stop and it will all be done through the mill.

So 90 percent of it is really good. Now let's get specific as into the areas coming through Kōloa Mill down towards the *pu'u* especially through the Knudsen property coming through the berm. I think the maps right now only specify the distance to the berm, but I think they breach it. There is a site that they go through. They know there is data recovery one site which means we are going to lose it.

When asked about archaeological sites, such as *'auwai* and the berm *mauka* (inland) of Po'ipū Beach Park Mr. Wichman mentioned:

Clearly the *'auwai* are going through there. The lands we are talking about right now are obviously the Kōloa Field System and then over that is the early ranching. These lands have pretty much stayed in ranching ever since the first *paniolo* (cowboys) started the enterprises as Kōloa was the port of entry for all shipping, so massive Kōloa field system that expanded during early historic. Historically these lands stayed in cattle. The walls that are going through there are intense. There is a lot of it in there and I know part of it is that they are talking about directional drilling because of the concern of the lava tubes and things that are also run right through this particular corridor. Exactly what they mean by that I am not really sure and how it is they are going to be coming across and down below Hapa Road I am not sure, but here we are looking at an aerial photograph that shows the sector where the actual waste treatment plan is. At certain points in one area it was old sugar. They actually planted sugar up to a certain line, but on a certain edge of it there are a lot of things that are still going on. The exact footprint of the Hapa Road Pump Station is not clear to me. Once I know that I think we can take the next step.

Then going out towards Māhā'ulepū we have a 1924 aerial photograph that shows the whole sector in dunes prior that. So exactly within the footprint of Makahuena I would like to know. I know it is on Grove Farm property. I know they are going through that sector. The lands floods right there behind Māhā'ulepū and the roads are built up on cause ways.

Māhā'ulepū or into Makahuena Point and then here also looking at the proximity of Kāneaukai Heiau. The *heiau* (place of worship) is lost. There is the *heiau* of

Kāne I Olo Uma which is in the proximity. It is in the *ili* (land section) of Wai'ohai.

CSH asked Mr. Wichman to speak about previous run-off from the Kōloa Sugar Mill, he stated:

Well it would have been Waikomo Stream, right where the reclamation plant is, where this area is coming. The water used to come right down into Kiahuna. Where they built Kiahuna is the main ponds right there. Then from those ponds right there then it drained out to sea. When they built Kiahuna they blocked that part of it. The *'auwai* that fed into Kāne I Olo Uma came off that one. When they plugged up the Wai'ohai, they forced the water and diverted it around the corner so they do have drainage issue problems there right now. Rupert and Billy will tell you.

Hapa Road where is the *luahine pi'i* (a place inland) whether that was incorporated in there and when you look at the whole extent of Hapa Road and its historic importance, not only as the King's Highway but the way it divided out the lands and partly protected all the cattle areas. There was massive cattle going on in those days, but yet it is a much older trail. So you are looking at an ancient trail that became a Kingdom Highway and then later on cattle all leading out to Hanaka'ape.

When asked about place names associated with Kōloa, Mr. Wichman shared:

There is Waikomo base and the stream basin that comes down. The main *heiau* (shrine) in the area is Maulili. Maulili was central around the pool just like *Ka'awakoa* of Wai'ale'ale and in Nu'alolo Kai also are essentially at one point around a spring. From there you have the main road, the main trail that leads you to Hanaka'ape, which is Kōloa Landing. In front of Beach Park almost a washed over island but still kind of connected is Nukumoi which we talked about earlier. You have the *ahupua'a* of Kualoa then Weliweli Ahupua'a which is a long narrow *ahupua'a* then the *ahupua'a* of Pā'ā. Pā'ā was given to Pi'iko'i and Pi'iko'i was Kaumuali'i's tobacco lighter. When Liholiho visited him in the early 1820s prior to kidnapping him he noticed that Kaumuali'i had his own tobacco lighter. Kaumuali'i gave Pi'iko'i to Liholiho as his personal tobacco lighter. When he passed away he was given into the household of Kahalei'a and then into the household of Kamehameha III where he was on the Privy Council and during the time of the *māhele* (division of lands) her was given the *ahupua'a* of Pā'ā. Then you have the *ahupua'a* of Māhā'ulepū then the *ahupua'a* of Kīpū etc. The Weliweli Ahupua'a is quite narrow. It is not necessarily one that is connected into a river basin or a natural drainage.

You have also in front here (Po'ipū) the big battle in Kūkona. Kūkona is the father of Manōkalanipō. At the time of the invasion, there was a combined invasion from the different islands; we are talking 15th century early 16th century, 1500s. A combined invasion fleet came into the Kōloa, Māhā'ulepū, Makahuena sector. Kūkona put his main war canoe fleet at Hanapēpē and his main land forces

right here and when they landed completed he shows himself and the whole armies troop inland, so he is leading them inland. In the meantime he sends his canoe fleet and destroys them on the beach because there were not very well protected. He destroys the invading canoe fleet and then now sandwiches the armies into two fronts and then he is able to get surrender. They go around the island and end up at Kōke'e in which they finally hammer out the deal from this point on you do not attack us again and in return we will not attack you. That piece stayed until Kamehameha tried to do his invasion. He broke that deal that was made by Kūkona. Also it was the end of a war that lasted 250 years after the death of Kaiwilauokekoa. The island was split in two between east and west as they warred out. Kaiwilauokekoa was betrothed to a west person then fell in love with an east person and then the west person started a war. That lasted for generations, but Kūkona after destroying the combined fleet marries his son Manōkalanipō to the last of the west side chiefness and united the island under one *mō'i* (king, sovereign) again.

Manōkalanipō is the one credited with the renaissance because now the great peace begins except for one civil war in Kawelo which part of it takes place here (Po'ipū) also in regards to Maulili. Kawelo, 'Aikanaka, Kaweleimakua they are cousins, but two sets of twins are born at Holoholokū. Huge storm it tears apart the *kapa* (bark cloth). The prophecy of their birth says that as long as these children are alive Kaua'i will be torn apart like the *kapa* in the storm. As they became into young men, 'Aikanaka captures and stones presumably Kaweleimakua to death and places him on Maulili which is right up road from here. Then in a storm Kawelo comes awake scares his guards to death escapes into Poli'ahu at Wailua and then 'Aikanaka comes into Wailua and goes into Nounou a big fight. It is both ceremonial in the way they insult each other and also in battle. Kaweleimakua finally becomes the victor he brings 'Aikanaka to Maulili where he was originally to be sacrificed and sacrifices 'Aikanaka on Maulili.

One thing that was also important to Kōloa and that Billy was talking about is the fishing. The place names that are here are related to the *kū'ula* (fish shrine). Part of the fishing consecration process for the fleet everything that was needed for a voyage was taken up on to the *heiau*. They spent the night and prayed. If the omens looked really good then they would launch the following day, if they didn't they postponed it. And then that puts particular type signature to the heiau itself with a long for core.

Also associated with Kōloa is Kīna'u of course Kīna'u was the sister of Pele, but she was more known for her sorcery yet she had many women and she dug in here. Pele actually only stops at Nōmilu and then moves on, but Kīna'u continues actually digs into Kōloa. Kīna'u is represented by the red tapa (bark cloth) with the black dots. Then she eventually marries Kalaipāhoa. She marries many of her women to Kōloa men.

Mr. Wichman shared his concerns about the proposed project in Kōloa and Po'ipū:

My concerns as they move along they will be breaching the berm itself. They will actually be taking out some of the sights, although originally designated to be taken out or data recovery, we lose those. Within the actual footprint of the Hapa Road area there may be some real sensitive issues because there are a lot of things going on right now, like the law suit. It will be difficult. Part of the reclamation of the water since it is good for irrigation could be considered for 'auwai use. It might be worth considering as a concession in this particular area that it would be done. That part of the reclamation water will help to make the 'auwai flow again. We can take a certain percentage of it actually goes back into the 'auwai and into sacred sites like Kāne I Olo Uma because it had that serious agriculture component. It may be a good concession to the culture, at least be considerate of that, however I think because of the Hapa Road footprint and what is going on with that particular sector right now we are losing sites really bad. This of course is on the edge of it but it would be incorporated as part of the whole scheme and seen as such. Although I know the pipes are only going to be buried three feet under the ground it is massive drilling through bedrock. So those are the facts too. If they actually commit to the directional drilling, my guess it is going to be really expensive. It is probably easier for them to just carve a trench through then it is to drill. So cost wise it will be a lot more expensive. The may be saying it now but actually whether they are going to end up doing it is another question.

The Hapa Road sector is problematic. There is a lawsuit going on right now. The level of sensitivity they would have to bring to that particular sector and would have to be looked at. It is important that I see the exact footprint where this pump station is going to be.

7.5.2 Mr. Billy Kaohelaui'i

Mr. Billie Kaohelaui'i was born on July 4, 1950 to Henry Kalima Kaohelaui'i from Ni'ihau and his wife Hazel Tita Kimokeo. Mr. Kaohelaui'i was raised in Kōloa where he presently resides. Mr. Kaohelaui'i heads a native organization called "Hui Mālama Kāne I Olo Uma". The group presently cares for the cultural sites bordered by Po'ipū Road and the parking lot of Brenneke's Restaurant at Po'ipū Beach in Kōloa. Mr. Kaohelaui'i currently works throughout the island of Kaua'i setting up stage productions for various musical entertainers.

CSH asked Mr. Kaohelaui'i about his cultural and lineal association with Kōloa and Po'ipū, he shared:

My name is Billy Kaohelaui'i. I have lived here all my life in Po'ipū right around here Kuai Road. This land here was my grandfather's land way back it still is now we are on it. My grandfather was the king of the fish down here. His name was James Kimokea but he owned all this land over here including Kāne I Olo Uma way back. Somehow he got this land from his brother and his brother got it from the chief Eke'ōpūni.

Weliweli Ahupua'a. He had a big role over here, my grandfather was a Policeman. He worked here and everybody knew him because he was a fishermen. In fact we just received a map about Hapa Trail that he owned Hapa

Trail, somehow he owned it. I think how Knudsen got all this land is through all the people. I don't think he even bought them. I think this was all leased lands and when the people died he over powered the land and took them so all these lands belong to the *kanaka* (people) yet. I don't know how Knudsen thinks he owns these lands?

When asked about the traditional cultural practices of his family and the potential impact the proposed project may have on the community, Mr. Kaohelaui'i answered:

When my grandfather fished it was different kind of fishing from today. We had *hukilau* (fish net with pull ropes) style. The whole family would be there because when they said to come down we had to be there. You had to put your hands in there you have to help because this is *hukilau* it is a family thing. You would see them *huki* (pull) that net and bring it all in. Then all you see is fish just kicking and you try to grab them because the thing flies in your eye and everything. Others in the community would come to help and then everybody comes and *huki* the net together. Then you see all the strong guys scoop them with baskets, this was old style nets, old style baskets. They never had buckets like today only old style baskets. They carried them all the way up to the car and then they had to take them to my grandfather's house. When we would go over to our grandfather's house and he would say, "This is your pile." You would get scared how you are going to take that in your car because it is a mountain of fish. The first pile he would make is for the church, which was my grandfather's style he always made for the church.

My dad was working for my grandfather. My dad is Henry Kaohelaui'i from Ni'ihau. When he came over he met my mom. Then they got together. My father was pure Hawaiian and could not speak really good English. He worked for my father on the sampan. My grandfather had about seven big sampan, fishing boats, tuna boats and they would come here to. I forget the name of river when a hurricane from way back they ended up in the river.

My grandfather was able to see the fish through the rain and he would point and then tell them to go get them. Everybody would get ready and take the boats right around the fishes and pick them up. He would then tell them to take care of everything and when you are finished with the catch they are to go straight to O'ahu with the boat. They unload their fish in O'ahu, they don't come home. My grandfather's favorite fish to fish for 'ō'io (*Albula vulpes*). He was the king of the fish over here.

Mr. Kaohelaui'i shared his knowledge of his family *ko'a* or fishing grounds:

Right here on Brennecke's Beach where my grandfather would catch the 'ō'io his favorite place when we would get our fish. Everyone get land mark like me I knew where the bottom of the ocean. I knew where all the fish was. I knew if I looked from the ocean I knew where I was. We had landmarks to go and come from the ocean some of them are now gone due to the new houses. Some is still here. Over here they always look at the points, but the points don't look the same.

Some is filled with buildings. So usually when they navigate from O'ahu it is direct, straight direct. Some of them just are automatic pilot. They are not steering the boat. They just head straight to the point. Makahuena Point is for the Honolulu and Tahiti destinations. That is the south point.

When asked about the effect of population growth had on traditional cultural practices, Mr. Kaohelaui'i mentioned:

Well everybody likes to live here now. It was way back in the 60s and 70s we had the beach to us *kama'āina* (native-born). The buildings came in 70s and 80s they were gung-ho!

CSH asked Mr. Kaohelaui'i when in his lifetime did he first notice fishing practices impacted by development in Po'ipū. He answered:

The developers buried all the fishponds. That is what happened. They covered all our fishponds. You wouldn't believe the fishponds use to be here. Right in front here had a nice fishpond (Pointing to Beach Park). You see (Pointing to the 1924 aerial photograph of Po'ipū), this all was *loko i'a* (fishponds). They were all filled in the 1960s. All of them were buried.

Where the hotels are was fishponds, but they rose up the hotel and that is why it does not drain. Oh, the fish is way less today and less because I think the run-off of all the rain and sewage. The fish stay way out side now. It is sad, because not that much like before time. (Mr. Wichman interjected sharing more about traditional cultural places with early photographs of Po'ipū) sharing that this is the *pua i'a* (fish spawn) that part of it is still in the parking lot (Brennecke's). You can still see. It is a little bit awkward this photograph. It is actually a peninsula that is still there. The county got a hold of it and filled it in. They built this road across here and now the water drains here through these ponds at the Wai'ohai and then out to sea. When they plugged that in all the water now is forced to the sector which comes down and naturally goes into the fishponds and floods the whole area. Every time we have a heavy rain it drains.

When asked about the fishing practices today and the *hāpapa* or coral reefs, Mr. Kaohelaui'i added:

This is Nukumoi. What I used to do out there is catch fish at Nukumoi. It was too rough out there for the women. They would not be able to gather *limu* at Nukumoi. They would gather *limu* on the other side. *Limu kohu* (*Asparagopsis taxiformis*), get *lipoa* (*Dicyopteria plagiogramma* and *D. australis*) all kinds. At Makahuena Point I used get my *wana* (sea urchin), '*opihi* (limpets), *moi* (threadfish, *Polydactylus sexfilis*) and *āholehole* (*Kuhlia sandvicensis*). Have *nenu* (pilot fish, *Kyphosus biggus*, *K. vaigiensis*), black fish, and *uhu* (parrot fish, *Scarus perspicillatus*), but very rare now they used to come way inside. Not like before. (Mr. Wichman interjected to direct us to the early photographs to help better see the effects of early and previous development to the shoreline of Po'ipū) and mentioned that in the 1950s and early photographs there has been serious shrinkage right here (pointing to an early photograph of Nukumoi)

definitely. The Lahaina Luna 1885 mentioned many *heiau*. The loko or (pond) right here is *kapua'a ho'olaina* is the name of this right here. It is really interesting the association of the *laina* (alignments) towards the *pua'a* (the altar on which a pig was laid as payment to a chief of an *ahupua'a*). Traditional alignment by the early Hawaiians when building heiau as this was.

Mr. Kaohelaui'i mentioned other traditional cultural practices in Po'ipū today:

We only fish little bit today. Little bit, because very little. Everything is going. We worry about so many things like population and chemicals. Surfing! This was a famous place in old days for that. That was my dad's spot. He called it "laugh-laugh" I don't know the Hawaiian name was. That is where I learned how to surf out there. They call it Wai'ohai is the name.

When asked about past history of Kōloa, Mr. Kaohelaui'i stated:

Lāwa'i was the beginning. There was some from Lāwa'i Kai because that was a navigational point. There was a navigation rock. Also the Pu'u Kilo i'a. That is the spot is where the canoes came in from Tahiti. Then they would always return to that very spot.

Yes. That is what they did. In long distance voyaging there were certain spots along this coast especially for landing. Kōloa landing was seat of all the navigation prior to Nāwiliwili. Lāwa'i was the beginning of the early arrivals and then spread out over the plains of Kōloa. After a study of Lāwa'i Kai in the valley and what came out of it was essentially that Lāwa'i was always been controlled by certain *ali'i* (chiefs). It is the coastal trail so as the *mō'i* and the families were going between Wailua and Waimea several times a year the armies would be following along the shore line. Between Wailua and Lāwa'i is the overnight stay so you are looking at a huge amount of agriculture with part of it as hardly any *hale* (house) settlements at all so that was a curious thing when you are looking at massive *lo'i* (wet land taro fields) and large *loko i'a* (fishponds). Out of the whole coast line as it comes down here at Kōloa following the old coastal trail is the trail they would have followed.

They did have a fishpond in Kāne I Olo Uma. A *kupuna* said that there were over a thousand canoes inside the fishpond. In the old days there was a pathway coming in with the canoes, one canal coming in with the canoes in Kāne I Olo Uma Fishpond. My guess is they came in to come into the *heiau* from Kahiki (Tahiti).

Mr. Kaohelaui'i (Looking at where the pump stations are on maps) mentioned the pump stations in Kōloa:

What happens is that the water is not draining through its natural drain because they filled it up and put a hotel on top. All of it is actually getting pumped up into Kōloa Mill. All the sewage from all these hotels and everything is getting pumped to this station which takes lines up to Kōloa Mill, then they process it all up there and then send out the clean water from there.

When asked to share his concerns with the proposed project, Mr. Kaohelaui'i mentioned:

My concerns no matter what they get up there is they I am going to be here. They dynamite, throws all this dust. My main concern is that everything they have up there is coming down to us. The smell the sewer is terrible now. Even the water now is different. It is not taste like before. I hope we don't have to drink that water. I am not. It all affects me. My taxes go up caught it development.

Now the Knudsen's are up for their renewal or whatever they have to do, but the 100 year lease is coming up soon, so that is why they are pushing all this development. They are pushing all these old plans from way back are being pushed through. I am not comfortable about this whole thing. I live here I smell it. I can smell it from down by the sea and my neighbors too. I can smell everybody's around here.

7.5.3 Mr. Rupert Puni Rowe

Mr. Rupert Rowe is of the Puni 'ohana of Kōloa. He is *kama'āina* to Kōloa where he was raised. Mr. Rowe presently is a member of the native organization "Hui Mālama Kāne I Olo Uma," which presently cares for the Kāne I Olo Uma site in Po'ipū:

When asked to share his concerns about the proposed project and the potential impact to Kōloa and the Po'ipū community, Mr. Rowe shared:

My name is Rupert Rowe. My 'ohana is the Puni Family of Kōloa. My grandfather was a *kahuna lā'au lapa'au* (medicinal healer) in the Hawaiian Culture. This area we are talking about was his gathering area in the caves where he would make his medicines. What has happened in the area has been a dramatic change that we were not prepared for were plans from the 70s injected into the 21st Century because we do have great problems with the drainage as I will get there.

Let's get to the points over there. Number one, we have development on the south side that is totally out of control. To help everybody get a better view of what is really happening in the area they have destroyed all the archaeological sites on private land in which I believe the State Historic Preservation Division had no control or any power to undo what has happened there so all the sites are gone. Culturally we lost a great thing of the past (referring to the Kōloa Field System), secondly, right now this development on this side and the sewer treatment (referring to Po'ipū) I would like to see the whole layout of everything if they can get that to me later on (meaning the client).

I want to concentrate on Kāne I Olo Uma. What has happened over the last fifteen years, the County does not have a drainage plan which they once had and signed off on. We have a problem right now because the water cannot drain, so the parking lot in floods. The Hotel Wai'ohai in which they built right upon the fishponds that was there so the natural drainage has been plugged on the bottom. They are trying to figure out how they are going to correct the problem. I don't

think it is possible, but we will see. Right now we have more injected wells on the south side I believe area wise than any other place in Hawai'i.

Storm run-off into the wells because everything on the south side, if you have an aerial view of the area you will see why there is a problem because they don't know how to move the water. The native people moved the water west because that was the only way to make the water drain properly so there fishponds in the lower area would be productive, but through development they have never really looked at the culture issues to protect the past so that the future can be set.

Now on this development on the top end they are draining water into Kāne I Olo Uma so there is a great problem right there and this problem lies because the site has to be registered. If it is registered under the federal and state then I believe the site cannot be used as a catchment basin.

This is a serious problem that we must really look at and concentrate on the drainage for the south side. We need answer on how everything is to be drained? As far as our culture sites, the private land owner which controls most of the south side has a great concern on destroying the sites on their private properties. We ask *kanaka maoli* (Native Hawaiian person) really cannot tell the private landowner if they can preserve our site because of development. So a lot of the sites were lost by poor planning by the planning department. I think Billy can add a little bit more.

What I am talking about is the drainage. The surface water, *kukae* (excrement) water. So they want to use Kāne I Olo Uma as the catchment basin because the bottom part is flooding right now and they cannot figure how to stop the flooding on the bottom part. So when you come down by the Wai'ohai and you look on the left hand side they bulldozed all inside there and they have three big pipes running out. That is surface water. Now from there where is the water going? Is it going to come to Kāne I Olo Uma or is emptying down in the Wai'ohai? There is no drain. It will go to the ocean. The aerial photographs gives you a better view of the seriousness of the existing problem because this is the only spot in the state of Hawai'i they only get injected wells.

Mr. Rowe shared his concerns about the proposed project:

The fisherman in this area is Billy. All the fishing in this area is not the way it once was before we could fill a couple coolers. Shoreline everything has changed. More people, the environment has changed and thus changed our culture. So whatever is happening I don't see a plan on preservation. There is no evacuation plan no signs we are the only county with no plan.

7.6 Aunty Wilma Holi

CSH conducted a "talk-story" interview with Ms. Wilma Holi at the Waimea High School Library on Kaua'i. Aunty Wilma is *kama'āina* to Hanapēpē, Kaua'i and also has lineal and cultural ties to Kōloa. CSH provided a project description and maps for her review. Aunty Wilma Holi provided the following information:

Hawaiians never consumed reclamation water it is against our religion. We have gone too far. It has gone so against our water springs like Waitā and Waikomo. There are wells up mountain by the cemetery. Now many dry streams and river beds. Outside of Kōloa just before 'Ōma'o a new bridge had a reservoir up there but no water in the stream. As you come into Kōloa by the tunnel of trees going to Kōloa Town.

The project planners need to go back into the history of Kōloa and Po'ipū to understand how was the community designed. It wasn't heavily populated. The Marquesas arrivals to the forest of Kōloa. Weliweli and Po'ipū was hot and dry areas. Closer to Lāwa'i was lush, maybe a rain belt? The island has lava tubes; water will percolate down and find a spring. Wai'ohai has many springs. Were they covered? We don't eat *kukae*. Why drink it? Where did the mill get their wash cane from? What is their source of water when they start? You have to have a water source for development. Looking at the capacity it is based on community. The Hawaiians managed their resources. Local live *mauka*, visitors live in the rich area. The smell of waste is everywhere. We need to think on how can waste be recycled and used for soil. Drilling? We will not know what is underground?

Grove Farm plans to develop east of the bypass on Weliweli side. My grandma is the last *kuleana* claim in Māhā'ulepū. Grove Farm closed off streams to flow into Po'ipū area. Is this done in anticipation for this project? Reclamation water does not work for local *kalo* (taro) which contains chemicals. They have to get their source.

Section 8 Cultural Landscape of Kōloa and Po'ipū

8.1 Overview

Discussions of specific aspects of traditional Hawaiian culture as they may relate to the project area are presented below. This section examines traditional cultural resources and practices identified within the project area in the broader context of the encompassing the project area in Kōloa-Po'ipū area and the Kōloa, Weliweli and Pā'ā Ahupua'a landscape. Excerpts from the previous two sections, including the *kama'āina* interviews and statements about the proposed project area, are incorporated throughout this section where applicable.

8.2 Hawaiian Habitation and Agriculture

Beginning possibly as early as 1450, the "Kōloa Field System" was planned and built on the shallow lava soils to the east and west of Waikomo Stream. The Kōloa Field System is characterized as a network of fields of both irrigated and dryland crops, built mainly upon one stream system. Waikomo Stream was adapted into an inverted tree model with smaller branches leading off larger branches. The associated dispersed housing and field shelters were located among the fields, particularly at junctions of the irrigation ditches (*'auwai*). In this way, the whole of the field system was contained within the entire *makai* (seaward) portion of the *ahupua'a* of Kōloa, stretching east and west to the *ahupua'a* boundaries. The field system, with associated clusters of permanent extended family habitations, was in place by the middle of the 16th century and was certainly expanded and intensified continuously from that time. From A.D. 1650-1795, the Hawaiian Islands were typified by the development of large communal residences, religious structures and an intensification of agriculture. Large *heiau* in Kōloa may date to this period.

Historical documentation shows Kōloa thriving agriculturally. An estimate in 1857 stated that "10,000 barrels of sweet potatoes were grown each year at Kōloa, and that the crop furnished nearly all the potatoes sent to California from Hawai'i" (Judd 1935:326). Sugar and molasses were also chief articles of export. Whalers used the Kōloa "Roadstead" from 1830 to 1870, and took on provisions of squashes (pumpkins), salt beef, pigs, and cattle (Damon 1931:176). Hawaiians grew the pumpkins on the rocky land north of the landing. There were also numerous salt pans along the shore near the landing that were used to make the salt (Palama and Stauder 1973:20).

Bernice Judd, writing in 1935, summarized most of what was known of the traditional Hawaiian life of Kōloa:

In the old days two large *'auwai* or ditches left the southern end of the Maulili pool to supply the taro patches to the east and west. On the *kuāmas* [embankments] the natives grew bananas and sugar cane for convenience in irrigating. Along the coast they had fish ponds and salt pans, ruins of which are still to be seen. Their dry land farming was done on the *kula* (dry land), where they raised sweet potatoes, of which both the tubers and the leaves were good to eat. The Hawaiians planted *pia* (arrowroot) as well as *wauke* (paper mulberry) in

patches in the hills wherever they would grow naturally with but little cultivation. In the uplands they also gathered the leaves of the *hala* (screwpine) for mats and the nuts of the *kukui* (candlenut) for light (Judd 1935:53).

In past oral history interviews, community members spoke of past Hawaiian habitation and agriculture in the Kōloa area. Edene Naleimaile Vidinha, said this about the crater, “But you know, the olden days, down in the crater, the Hawaiians used to plant watermelons and potatoes, never saw anything like that. So now, it’s filled with houses.” Stella Burgess says, “Further north of the project area, in the valley, the ancient Hawaiians would grow sugar cane. She said the sugar cane was used for medicinal purposes and for tassels for arrows. She also said *lehua* (which also grew near the ocean), *pili* grass and medicinal herbs were grown. Mrs. Burgess was taught that *noni* (*Morinda citrifolia*), which was found in the area, was not made into a tea but eaten as fruit. She continues, “They also had *kukui* (*Aleurites moluccana*) for the fishermen as well as breadfruit. ‘*Uhaloa* was possibly grown by individual families in *auwai*, but probably did not grow in abundance as it does on the west side of Kaua’i. *Pōpolo* (*Solanum nigrum*), which was eaten in a salad and also used medicinally was grown everywhere.”

Mr. Randy Wichman said, “The *auwai* are going through there. The lands we are talking about right now are obviously the Kōloa Field System.”

Project participant Mr. Rupert Rowe noted that the native people moved the water west because that was the only way to make the water drain properly so there fishponds in the lower area would be productive.

Eighty-nine *kuleana* awards were given to individuals within Kōloa Ahupua’a. The majority of these Land Commission Awards (LCAs) were located in and around Kōloa Town itself. No LCAs were granted within the present project area; however an 1891 map of Kōloa by M.D. Monsarrat indicates two LCAs (LCA 3606 and 10272) in the vicinity of the southwest portion of the project area (Figure 6 & Table 1), and three LCAs (LCA 6667, 6309, and 3584) in the vicinity of the northwest portion of the project area (Figure 7 & Table 2). Mrs. Burgess has researched a *kuleana* land holder, Mika [Kailihakuma], who was awarded LCA 6667 during the Māhele. According to LCA records, at the time of the Māhele, he grew Irish potatoes, oranges, bittermelon, gourds and yams. There was a wall and a fence on his property and a government road ran through his property. He did not live here, but lived in Māhā’ulepū. The area of the LCA was called Makapa’ala. From the Mika holdings, the property ended up in Mrs. Burgess’s *’ohana* (family). In that section, there it was told that there was a *heiau* to Laka. *Pili* grass was often offered at the *heiau*. Also in the Makapa’ala area was the home of a family named Nakai or Naka’iwelo, who were canoe builders. She says that there may be burials in the area because “they always buried near the *hale* (house).” Along Hapa Road, there were some individual homes there as well. They would grow *’uala* (sweet potato, *Ipomoea batatas*) and sugar cane in their time period. The entire area was known as Pa’uolaka, “the skirt of Laka.” The area was not dedicated for hula, but for agriculture. Laka was a duality god- male and female. 500 acres were dedicated for Laka during the time of Mānokalanipō, who was responsible for the resurgence of agriculture in the south shore area. Beryl Blaich of Mālama Māhā’ulepū speaks about the *kuleana* records of the project area. She says, “As you no doubt recognize several of the Pā’ā ahupua’a parcels were located in ‘marsh’ which became Waita- the largest reservoir in Hawai’i. It seems that several of the applicants did not receive grants allegedly because their claims,

written by the school teacher (public school located at Māhā’ulepū) named Kekele, were rejected in Honolulu as Governor Kanoa said they were ‘soiled and improperly written.’”

Hunting was popular in and in the vicinity of the project area during modern times, as Mitsugi (Mitaru) Muraoka shared, he hunted “all around the Waitā side.” He recalled there “used to be plenty birds” including pheasants. However, during the time of his interview in 1987, he says that hunting was restricted to certain times only a few birds could be taken. Isaac Brandt in a past oral history interview shared that his father would hunt pheasant and his mother would pluck the birds to make feather leis. Kōloa Resident #1 recalls pig hunting near Waitā Reservoir, although he himself only went once.

8.3 Marine and Freshwater Resources

The Kōloa *ahupua’a* is well watered by constantly flowing streams. Two of these, the ‘Ōma’o, “green,” and Pō-’ele’ele, “dark night,” feed the area of Pīwai (a variety of wild duck). Where they join, the stream becomes Wai-komo, “entering water,” which flows down the center of the land, bringing life to the drier regions toward the seashore. It is so named because from time to time the stream disappears for a bit before reappearing farther down the slope. Stella Burgess says that Waikomo Stream may have been ten times a big as it is now and had many *auwai* extensions. There was an *auwai* where the Sheraton Resort is now and went to Kīahuna.

Makai of the project area, native Hawaiians in Kōloa would fish along the Po’ipū coastline. Mrs. Stella Burgess described fishermen in ancient times saying, “Many ancient Hawaiians had temporary shelters in the area. The families would have a *kuleana* (property) *mauka* (inland) and another *makai* (towards the sea) and go back and forth.” She also added that the Ainako house lot was near there and they were a family of permanent fishermen next to the Grand Hyatt Resort in Po’ipū.

In more modern times, many Kōloa residents would fish and swim in the Waitā Reservoir, Waikomo Stream and plantation ditches. From the University of Hawai’i Oral History project on Kōloa in 1987, a few participants described fishing and swimming activities in and near the project area. Burt Hiroshi Ebata stated that although Waitā Reservoir was a restricted area, the kids would catch goldfish. He also remembered big *’o’opu* as well. Once the Reservoir “dried up” because of a drought, and he could see all the huge *’o’opu* there. He also added that they had catfish and *’ōpae* (shrimp) in the mountain streams in the Māhā’ulepū area. He and his childhood friends would catch *’ōpae* in big ditches. There were also frogs in the big ditches. He also recalled swimming in Wailana (also known as Waikomo) Stream, the Waitā Reservoir and in the stream along the Kōloa Fire Station. Louis Jacintho, Jr. also remembered swimming in the plantation ditches and Wailana Stream. He also recalled the *koi* and goldfish in Waitā Reservoir, although they did not catch them to eat. He stated that the fish in the reservoir were tilapia, largemouth bass, tucanan, which are like bass from Argentina, *pākē*, *’o’opu*, or catfish. In the plantation ditches, there was *’o’opu*. He was a caretaker of the tunnels, where the ditch came from the Lihū’e powerhouse and in the tunnels, there was *’ōpae*. Mitsugi (Mitaru) Muraoka also mentioned fishing. As a child, Kōloa Resident #1 recalls fishing in the Waitā Reservoir and the plantation ditches for bass, tilapia, *koi* and frogs.

Project participant Mr. Randy Wichman noted that fishing was important to Kōloa. The place names that are here are related to the *kū’ula* (fish shrine). Part of the fishing consecration process

for the fleet everything that was needed for a voyage was taken up on to the *heiau*. They spent the night and prayed. If the omens looked really good then they would launch the following day, if they didn't they postponed it. And then that puts particular type signature to the *heiau* itself with a long for core. He also mentions that there is the *pua i'a* (fish spawn) that part of it is still in the parking lot (Brennecke's).

Kama'āina, Mr. Billy Kaohelauli'i noted that many fishponds use to be here in front Brennecke's had a nice fishpond (Pointing to Po'ipū Beach Park) and that it was all *loko'ia* (fishponds). They were all filled in the 1960s. All of them were buried." He added, "What I used to do out there is catch fish at Nukumoi. It was too rough out there for the women. They would not be able to gather limu at Nukumoi. They would gather *limu* on the other side. *Limu kohu* (*Asparagopsis taxiformis*), get *lipoa* (*Dicyopterus plagiogramma* and *D. australis*) all kinds. At Makahuena Point I used get my *wana* (sea urchin), *'opihi* (limpets), *moi* (threadfish, *Polydactylus sexfilis*) and *āholehole* (*Kuhlia sandvicensis*). Have *nenu* (pilot fish, *Kyphosus bigbus*, *K. vaigiensis*), black fish, and *uhu* (parrot fish, *Scarus perspicillatus*), but very rare now they used to come way inside. Not like before."

8.3.1 Salt

The manufacture of salt was important for the Native Hawaiians. Many of the larger salt pans on Kaua'i are located near Nōmilu. The importance of salt manufacture in the area was illustrated in the 1874 Boundary Commission determination for Kōloa, where the oral testimony of Pene Kalauau claimed he had come all the way "from Koolau to go to Kōloa for salt" (Boundary Commission, 1874, Kauai, Vol. No. 1:124) Other salt pans were noted at Kane-milohai and at Pau-a-Laka adjacent to the [older coastal] road [at Kōloa] (Kikuchi 1963:66-67). At Pā'ā, "the seafront is dominated by a crescent beach called Ke-one-loa, "long beach," where there were *kuakua pa'akai* (salt ponds)" (Wichman 1998:45). Abraham Keli'iokapalapala Aka shared the process of salt-making in Kōloa in the 1987 UH Oral History Study. However, no community members interviewed for this CIA mention salt-gathering.

8.4 Gathering Plant Resources

Hawaiians utilized upland resources for a multitude of purposes. Forest resources were gathered, for not only the basic needs of food and clothing, but for tools, weapons, canoe building, house construction, dyes, adornments, *hula*, medicinal and religious purposes.

Modern gathering of plants is documented in the University of Hawai'i Oral History project on Kōloa in 1987, many participants described gathering fruits. Burt Hiroshi Ebata said he would gather mountain apples, mostly in the area behind the Waitā Reservoir. He also describes picking mangoes and java plums. Louis Jacintho, Jr. recalled going, "in the pastures, get mangoes, or go up into the mountains, get mountain apples, rose apples, up on the hill 'guaiavis,'" or Hawaiian guava as well as "choke plum."

During this assessment, cultural consultants mentioned some gathering of plant resources. Stella Burgess knows of no one who currently gathers any plants in the area as people do not know what pesticides are being sprayed where. Many people grow and gather their own plants and herbs on their own properties. She does say that flowers are often gathered in the project area, specifically *'ilima* (*Sida*) from the Pu'uwanawana area to the former cane fields. There is

also *hina* in the neighboring Māhā'ulepū area, but none in the project area as it needs salt and lime rock to grow. She makes leis out of *hina* (possibly *Heliotropium anomalum*), which is a baby cactus. As a child, Kōloa Resident #1 would gather mountain apples and the purple "choke plum" in the area. Kōloa Resident #2 said there pockets of native plants along the side of the road in Kōloa once in awhile, but more so on the Māhā'ulepū side of the project area where there is *anapanapa* (*Columbrina asiatica*). Project participant Mr. Rupert Rowe mentioned that his grandfather was a *kahuna lā'au lapa'au* (medicinal healer) in the Hawaiian Culture and the area we are talking about was his gathering area in the caves where he would make his medicines.

8.5 Wahi Pana (Storied Places)

The Kōloa, Weliweli and Pā'ā *ahupua'a* are *wahi pana*, rich in *mo'olelo*. For Hawaiians, the *mo'olelo* does more than explain an area; it reconnects the land with its own spiritual past.

In the Kōloa *ahupua'a mo'olelo* are told on the gods Kāne and Kanaloa visiting Maulili Pond and leaving impressions of their forms on the *'āpapa* (coral flat). Kiha-wahine, the fearsome *mo'o* goddess, lived in Waihānau Pool, near Maulili Pond. When she was in residence, the water turned red and no one dared to swim there (Wichman 1998:40). There is also the story of 'Aikanaka attempting to sacrifice his cousin Kawelo at Maulili Heiau, which has not been found by modern archaeologists. Also in Kōloa, is the tale of the small stream Weoweopila on the plains of Kamo'oloa in which a fisherman refuses to give fish to an old woman. On his journey home, he feels more and more weary, as the sun grows hotter and hotter and he realizes the old woman was Pele. In the makai area of Kōloa there is the *mo'olelo* of Kaikapū, a sea *mo'o* who is trapped by a young boy named Liko. The *mo'o* is said to be trapped even to this day. In Weliweli *ahupua'a* there are tales about Makahūena, "eyes overflowing with heat" that the shimmer of the sun are the spirits of Hawaiian warriors passing through (Wichman 1998: 44). Also in Weliweli, Palila defeats a Kona enemy by cutting down a forest. In Pā'ā, there is the *heiau* of Kāne'aukai, the fishing god, who aids two fisherman by turning into human form and teaching them *'oli* to catch more fish. Pā'ā is also famous for its delicious *he'e*. Keakianoho, the Pā'ā *konohiki* who loved *he'e*, was disturbed when the *he'e* were being eaten by a giant crab.

Project participant Stella Burgess shared a few *mo'olelo* of the area. She described the Battle of Palena and Palilia that took place near Waitā Reservoir and a little below it in the 16th century. There were many *lehua* (*Metrosideros macropus*) trees and the ground was soft and spongy. When Palila's father was fighting the battle, Palila saw that the enemies were hiding in the trees. He had the men cut down the *lehua* trees so the *lehua* became a part of the soil, and the soil became very soft and spongy. This is how the soil became the way it is today.

Randy Wichman also mentions the Po'ipū area was the stage for battles between chief Kūkona and invading neighbor island forces in the early 15th century. Generations later, a civil war splits Kaua'i in two and battle between cousins Kawelo and 'Aikanaka. 'Aikanaka attempts to sacrifice Kawelo on Maulili Heiau, but Kawelo is saved by a great wind. Mr. Wichman also associates Kōloa with Kīna'u. Kīna'u was the sister of Pele, but she was more known for her sorcery yet she had many women and she dug in here. Pele actually only stops at Nōmilu and then moves on, but Kīna'u continues actually digs into Kōloa. Kīna'u is represented by the red tapa (bark cloth) with the black dots. Then she eventually marries Kalaipāhoa. She marries many of her women to Kōloa men.

8.6 Cultural and Historic Properties, including Iiina (Burials)

Clearly Kōloa was a particularly important *ahupua'a* in traditional Hawaiian times. The fact that at least fourteen *heiau* of varying sizes and functions have been documented in the Kōloa area (Thrum 1907, Bennett 1931), and that these *heiau* are associated with many legendary-historic figures such as Kawelo and 'Aikanaka, suggests a heightened cultural richness of the *ahupua'a*. The 1885 Makea was able to describe fourteen *heiau* (religious structures) within the Kōloa area. Of the 14 *heiau*, five were associated with human and animal blood sacrifices (*luakini* and *po'okanaka*), five with fishing, two medicinal, and one agricultural, with one of unknown function (Lahainaluna 1885 HMS 43 #17). Thomas Thrum was the next to document sites in the Kōloa area in his list of the *heiau* of Kaua'i (Thrum 1907). He discussed six *heiau* in the district of Kōloa, which once extended from Hanapēpē to Māhā'ulepū (Table 3). The *heiau* were Hanakalauae (Kōloa Ahupua'a), Kanehaule (inland Kōloa Ahupua'a), Kihouana (Kōloa Ahupua'a), Kaneioulouma (Kōloa Ahupua'a), Weliweli (Weliweli Ahupua'a), and Waiopili (Māhā'ulepū Ahupua'a).

The Koloa Sugar Company built a new, large mill in Pā'ā in 1912 about a mile from Kōloa. New railroad track was laid, and an asphalt road was built to connect the new mill with Kōloa Landing. World War I caused a huge demand for sugar. By the end of hostilities in 1918, the Koloa Sugar Company was producing 9,000 tons of sugar each year, and adding additional acreage. The mill in Pā'ā was finally closed in 1996, and remains a landmark of the countryside. Ms. Blaich states the historic value of Kōloa Sugar Mill, as it was built in 1913 as well as graveled dirt haul cane roads, many of which were haul cane rail routes until about 1954. Mr. Francis Ching mentioned when the railroad berm was being laid, the rocks from the cultural sites along the way were used to construct the berm, so very few sites will be discovered.

Mr. Reginald Gage in 2005 said there is a steep rock (Pali-O-Kōloa) on the east bank of the Waikomo Stream, which is referenced in *Thrum's Hawaiian Annual*. There is supposed to be a petroglyph on it and also a picture, but he has never seen it.

Mr. Randy Wichman shares about the *heiau* in the project area, "The *heiau* (place of worship) is lost. There is the *heiau* of Kāne I Olo Uma which is in the proximity. It is in the *ili* (land section) of Wai'ohai. The main *heiau* (shrine) in the area is Maulili. Maulili was central around the pool just like *Ka'awakoa* of Wai'ale'ale and in Nu'alolo Kai also are essentially at one point around a spring. The main *heiau* (shrine) in the area is Maulili. Maulili was central around the pool just like *Ka'awakoa* of Wai'ale'ale and in Nu'alolo Kai also are essentially at one point around a spring."

According to Clyde Nāmu'o of the Office of Hawaiian Affairs, there are, "Numerous cultural sites including, but not limited to *heiau* complexes and fishing shrines are situated within the assessment area."

Several participants acknowledge the possibility of finding *iwi kūpuna* in the project area. Stella Burgess states that in the project area, and neighboring Māhā'ulepū and Makwehi, bones that are found are usually from large battle with Kukonaala'a. Many believe that the *iwi* found in the area are from the battle with Kamehameha, but they are actually from Kukonaala'a's battles. Kōloa Resident #2 shares that many of the burial sites between Kōloa and Po'ipū, where current projects are being built, were not recorded. Of a differing viewpoint, Mr. Ching believes that

very few burials will be found as the project follows previously harrowed grounds. However, if burials are found, they will be easily identified by looking at the stones closely. The walls in burials are nicely lined up. If they aren't, they are probably sweet potato mounds.

8.7 Lava Tubes and Caves

There are many underground lava tubes and caves in the Kōloa *ahupua'a*. "In the area between Koloa town, Koloa Mill and the flat pahoehoe lands below Kaluahonu (Waitah or Koloa reservoir) several caves and shelters were found" (Kikuchi 1963: 55). According to Katherine Bukoski Viveiros in a 1988 Oral History of Kōloa, "Kaluahonu Cave is close by the Waita reservoir. The plantation used to dump human waste and rubbish from all the camps into this very large cave" (UH 1998: 697-698). Mr. Gage stated that there are many caves in Kōloa, but thought that the caves were likely used for habitation rather than burials. He could not recall seeing burials in Kōloa, except along the shoreline. Francis Ching also refers to the lava tubes, as potentially yielding some sites but acknowledges that the project area likely does not include the lava tubes. When Stella Burgess was young, she saw underground caverns or volcanic tubes near the Kōloa Neighborhood Center area with water flowing through them. She says that it is likely that *iwi kūpuna* will be found in Kukui'ula and Kōloa, which is full of underground lava tubes. Kōloa Resident #1 mentioned that there are underground lava tubes in the Kōloa town area and that some of his neighbors had hit the lava tubes when digging their cesspool. Kōloa Resident #2 says that the whole area is sensitive and may yield cultural historic properties, because they may inadvertently dig into the underground caves.

Section 9 Summary and Recommendations

At the request of Wilson Okamoto Corporation, CSH prepared this CIA for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System, Kōloa, Weliweli, and Pā'ā Ahupua'a, Kōloa District, Island of Kaua'i, TMK: [4] 2-8-004: por. 003; [4] 2-8-008: por. 001 & por. 036; [4] 2-8-009: por. 001; [4] 2-8-011: por. 001; [4] 2-8-014: por. 005, por. 019, por. 023, por. 030, & por. 037; [4] 2-8-022: por. 001, por. 011, por. 021, & por. 030; [4] 2-9-001: por. 001.

In addition to conducting background research into the traditional and historic importance of the project area, in the context of Kōloa, Weliweli and Pā'ā Ahupua'a, including results from archaeological studies, CSH also made a substantial effort to consult with community members and organizations. CSH attempted to contact 52 community contacts (government agency or community organization representatives, or individuals such as cultural practitioners) for the purposes of this CIA, 31 people responded, one provided a short testimony and ten *kūpuna* (elders) and/or *kama'āina* (native-born) were interviewed for more in-depth contributions to the CIA. Six interviews are currently pending approval and were not included in this report.

HOH Utilities, LLC proposes to develop a privately-owned and operated regional wastewater reclamation facility and associated wastewater collection system in the Kōloa-Po'ipū region on the south shore of the Island of Kaua'i. The proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility (Regional WRF) and collection system (hereinafter collectively referred to as the "project area") is intended to collect and treat wastewater associated with a service area encompassing the communities of Kōloa Town, Po'ipū, and Kukui'ula. The proposed wastewater collection system improvements would consist of four wastewater pump stations (Kōloa WWPS, Villages WWPS, Crater WWPS, and Eastern WWPS) along with gravity lines and force mains situated within existing undeveloped lands, roadways or along established utility line corridors or unpaved roadway corridors within a predominantly agricultural area.

Associated ground disturbance will include excavation related to the project area's development, to include: structural footings, utility installation, as well as roadway and parking area installation. Broadly, this CIA considered the Area of Potential Effect (APE) to be the project area footprint within the larger context of Kōloa, Weliweli and Pā'ā Ahupua'a.

9.1 Results of Background Research

Background research conducted for this project yielded the following results:

1. From previous archaeological studies and historic accounts it appears that pre-contact habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. As an extensive irrigated complex, the Kōloa Field System was used to divert the waters of the Waikomo Stream for taro, native sugar, and fish.
2. In the early post-contact era (1795-1880), the Kōloa Field System continued in use for foreign trade and was probably further intensified. Sweet potatoes were a main crop for the whaling and merchant ships, and the purchase of pigs, salt, oranges and other items are noted in many ship journals.

3. Documents of the Great Māhele show that by the mid-1800s there were still several traditional farmers within Kōloa who both lived and worked within the area. The individual claims – for both *lo'i* (wetland) and *kula* (dryland) suggest that while traditional farming of taro for subsistence was still taking place, in *kula* lands – sugar cane production for sale to the nearby sugar mill, had begun to dominate the landscape. Of the LCAs within Kōloa, several claim a *kula* planted with cane or a cane field or sugar cane garden. Several also identify cane lands as boundaries for the LCAs.
4. Within three years of sugar cultivation by Ladd and Company in 1835, residents in and surrounding Kōloa were quickly moving to adapt to the new economy based on the production of sugar cane. Eventually, most of inland Kōloa was planted with sugar cane and only the rockiest areas, unsuitable for cultivation, survived the dramatic changes in the landscape brought about during the early 20th century. A 1935 map of Koloa Sugar Company shows the extensive cane lands within the project area (see Figure 8).
5. The Kōloa Sugar Company had previously purchased the *ahupua'a* of Pā'ā southeast of Kōloa town. A new mill was built in Pā'ā in 1912 about a mile from Kōloa Town, and in the immediate vicinity of the proposed Regional WRF (see Figure 10). The mill in Pā'ā was finally closed in 1996.
6. By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline. Although the town had established a Civic Center in 1977, the pace of tourism-driven development at the shoreline drew construction and service jobs away from the town center.
7. Based on background research, historic properties (i.e. archaeological sites) in the form of pre- and post-contact surface architecture may be encountered during the archaeological inventory survey of the project area. Historic research has indicated five LCAs in the vicinity of the project area, suggesting indigenous Hawaiian land use in the form of habitation and agriculture. Previous archaeological research has documented evidence of both pre- and post contact land use in the area.
8. Evidence of indigenous Hawaiian land use could include both habitation (platforms, enclosures, and C-shapes) and agricultural (terraces, mounds, field walls, etc.) features. Evidence of post-contact land use is likely to be associated with historic sugarcane cultivation and could include irrigation infrastructure (ditches and flumes), sugar transport infrastructure (road causeways, railroad berms, etc.), clearing mounds, and boundary walls..
9. It should be noted that due to the extensive sugarcane cultivation documented within the project area, mechanized land modifications associated with sugarcane cultivation has likely disturbed and/or destroyed any pre-contact historic properties that may have been present. Additionally the project area is situated primarily within in-use roadways and old cane haul roads, which have caused additional land modifications within the project area, disturbing and/or destroying historic

properties. Thus the probability of encountering surface historic properties during the pedestrian inspection is low.

9.2 Results of Community Consultation

CSH attempted to contact 52 community members (government agency or community organization representatives, or individuals such as cultural practitioners) for the purposes of this CIA, 31 people responded. One provided a short testimony and ten *kūpuna* (elders) and/or *kama'āina* (native-born) were interviewed for more in-depth contributions to the CIA. Two interviews are currently pending approval and were not included in this report. The findings of this CIA suggest that there are a few key areas of cultural interest and concern regarding the proposed project. Community consultation shows:

1. According to community contacts, the site of the Kōloa-Po'ipū Wastewater Reclamation Facility and Collection System and vicinity is likely to have surface and subsurface cultural and historic properties, including human skeletal remains. Several of the study participants are concerned about *iwi kūpuna* (ancestral remains) and cultural and historic properties in or near the project area.
 - a. Clyde Nāmu'o of OHA states, "Numerous cultural sites including, but not limited to heiau complexes and fishing shrines are situated within the assessment area and community groups are actively working to preserve these cultural sites for future generations."
 - b. Stella Burgess says that it is likely that *iwi kūpuna* will be found in Kukui'ula and Kōloa, which is full of underground lava tubes. She recommends that if any cultural historic properties, such as *iwi kūpuna* are found, the construction should stop. She hopes that the project proponent will be sensitive toward cultural issues and the project will keep "above board" and if anything is found, it should be reported. She recommends for a special place to be designated for the *iwi kūpuna* and they should be put back as quickly as possible not to create another Wal-Mart situation (in which cultural and lineal descendants as well as members of the community expressed outrage over the treatment of the 25 sets of human remains found during construction.) She would like to be contacted if any *iwi kūpuna* or other cultural historic properties are found.
 - c. Mr. Francis Ching, archaeologist and former Kaua'i resident states that because most of the project area is on sugar cane lands that were previously harrowed, it is most likely that very few sites will be found. However, if burials are found, they will be easily identified by looking at the stones closely. The walls in burials are nicely lined up. If they aren't, they are probably sweet potato mounds. He recommends that a cultural monitor be present during construction.
 - d. Kōloa Resident #2 says that there are additional significant cultural resources that have not been adequately documented and assessed by prior historic-preservation work. She says that to her knowledge no one has surveyed the

underground caves. She says that many of the burial sites between Kōloa and Po'ipū, where current projects are being built, were not recorded.

- e. Mr. Randy Wichman voiced his concerns with the proposed project in the *mauka* regions of Po'ipū saying, the project proponent, "will actually being taking out some of the sites, although originally designated to be taken out or data recovery, we lose those [sites]." He is concerned the project proponent will breach the railroad berm. He also mentioned that "within the actual footprint of the Hapa Road area there may be some real sensitive issues because there are a lot of things going on right now, like the law suit." He recommends a higher level of sensitivity be used in the Hapa Road area. Although the project will be near the edge of Hapa Road, he asks the area be looked at as part of the whole scheme and seen as such." He is also concerned with the "affect the project may have on the Kāne I Olo Uma site because it had that serious agriculture component."
 - f. Mr. Rupert Rowe is also concerned for the safety of the Kāne I Olo Uma site on the edge of the project area.
2. The project area and environs, has a long history of use by Kānaka Maoli (native born), and other *kama'āina* groups for a variety of cultural activities including fishing, the gathering of plants and fruits like mountain apple (*Syzygium malaccense*), java "choke plum" (*Syzygium cumini*) and 'ilima (*Sida*). Community participants expressed concern that *mauka* access is restricted as a result of past development and that access to cultural and natural resources has been disrupted. Two project participants shared their concerns about the limited access of Waitā Reservoir, which is impeding cultural practices. One participant mentions ongoing gathering of plants in the project area.
 - a. Beryl Blaich says, "Since the plantation closed, the community has lost access to Waitā Reservoir where there are now commercial operations, as well as to the cane haul road along the mill, which the community traditionally used to go to Māhā'ulepū, and to the valleys and ridges where pigs were hunted and people did gather plants." She continues by saying that although landowners and leasees are concerned about liability, vandalism and already commit money to management of the area, community members resent their exclusion to formerly used areas.
 - b. Kōloa Resident #1 recalls fishing in Waitā Reservoir as a child and thinks that access should be granted to the public. He says that the children of today should be able to go fishing at Waitā.
 - c. Stella Burgess mentioned flowers are often gathered in the project area, specifically 'ilima from the Pu'uwanawana area to the former cane fields.
 3. One community member also is concerned with the wild pigs from the *mauka* regions making their way to the coastal area. Beryl Blaich states that these wild pigs have created a problem in the native plant restoration project of Grove Farm leasees David

and Linda Burney. She continues mentioning that she is unsure if the pigs are also a problem for the GMO corn operation starting in Pā'ā and Māhā'ulepū.

4. One cultural consultant is concerned with the project's impacts to view corridors. Beryl Blaich expresses Mālama Māhā'ulepū's concerns with the visual and environmental impacts to Pu'u Wanawana, Pu'u Hunihuni and Pu'uhi Reservoir. "We are concerned about the visual impact of the proposed eastern pump station and the crater pump station on these puu, especially looking mauka from the coast to the mill."
5. One project participant is concerned with the historic preservation of the Kōloa Sugar Mill. Beryl Blaich says, "The mill itself is a historic icon. From the Makawehi and Punahoa limestone headlands on the coast, the mill presents a distinctive profile yet does not obscure the singular coastal craters. Ideally, the mill will not be demolished but reused and no future structure near it will obscure or dominate it."
6. Beryl Blaich also expresses concern about possible environmental impacts on two of the craters. After the winter rainy season, they hold intermittent lakes that are frequented by migratory water birds. She is concerned that the wastewater plant will cause the birds of the area to become endangered.
7. Mr. Randy Wichman expressed his concerns with the cost of the project saying, "The massive drilling through bedrock. If they actually commit to the directional drilling, my guess it is going to be really expensive. It is probably easier for them to just carve a trench through then it is to drill. So cost wise it will be a lot more expensive."
8. Several community members express a desire for a preservation or development plan for the area.
 - a. Beryl Blaich recommends for the Kōloa-Po'ipu-Kalāheo development plan to be updated. She states that there "is a need for [a] master plan for this important area as well as for the development plan [to] update Koloa's undeveloped lands."
 - b. Mr. Rupert Rowe states, there is "no plan for preservation" and that Kaua'i is, "the only county with no evacuation plan or signs."
9. Several community members recommended the project proponent discuss the project with the community or look to the past to solve planning problems.
 - a. Stella Burgess recommends the developers ask for help when dealing with cultural issues. She advises the project proponents to consult with the community in general and in particular with Grace Bacle, whose family comes from the South Shore.
 - b. Kōloa Resident #1 recommends the project proponent hold public meetings and update the community on the proposed project. Project participant
 - c. Mr. Randy Wichman mentioned the importance of place names and their association with the history of Kōloa. He also mentions it is important that the exact footprint is for public view where this pump station is going to be.

- d. Community member Ms. Wilma Holi stated project planners need to go back into the history of Kōloa and Po'ipū to understand how was the community designed.
10. Two community members voiced concerns or recommendations regarding water resources in the project area.
 - a. Mr. Randy Wichman stated, "Part of the reclamation of the water since it is good for irrigation could be considered for 'auwai use. It might be worth considering as a concession in this particular area that it would be done."
 - b. Aunty Wilma Holi Aunty Wilma Holi voiced concerns about the lack of water and the source of water for this project. She also stated concern for the many dry streams and river beds and that there is a new reservoir but no water in stream. She also recommended recycling the waste to be used for soil.
 - c. Mr. Tommy Oi voiced the benefits of the project saying the proposed project, "would be a better way to contain all your sewage and waste. Most waste will be contained. I know that they can recycle the water. A lot of that water can be used by the community and for irrigation. It is just something that is going to help the area so I don't have any concerns."
11. Three participants are concerned with the smell and noise that may be generated from the Pump Stations.
 - a. Kōloa Resident #1 is most concerned with the smell the Kōloa Pump Station will generate. The Kōloa Pump Station is very close to his home.
 - b. Kōloa Resident #2 hopes that there will be no odor or noise from the facility at the Mill.
 - c. Aunty Wilma Holi is concerned with, "The smell of waste is everywhere."
12. One participant recommends that the project proponent take responsibility for cleaning the area near the old Kōloa Mill. Kōloa Resident #2 is suggests the project proponent clean the area by removing abandon cars and other garbage in the area, and making the area more presentable, instead of just being a "brownfield."
13. Two project participants voiced concern that they would be forced to hook up to the new sewage system which would be expensive. They are also concerned the project will lay the pipes through their backyards and property.
 - a. Kōloa Resident #1 believes the project is unnecessary and will probably not hook up to the system. He stated that many of the Kōloa community members he knows are satisfied with the current cesspool system they have and also will not hook up. He believes this project will benefit upcoming businesses and the Kōloa Creekside subdivision, not the existing community members.
 - b. Kōloa Resident #2's family is also concerned about the cost of hooking up to the sewage system. They explained that many community members had recently renovated their cesspools after Hurricane 'Iniki . They also do not want project pipes in their backyards and properties.

14. Three participants expressed sadness, frustration, or negative feelings about the overall cumulative impacts of ongoing and future developments in Kōloa-Po'ipū as contributing to the loss of what is authentic and traditional about the area:
- a. Kōloa Resident #1 sees this project as “opening the door to more development” in the Kōloa-Po'ipū area
 - b. Kōloa Resident #2 is concerned about the project's long-term impacts on the community. She stated that new infrastructure (sewer system, new water system, etc) may mean that a significant zoning change or large development project is anticipated and thus, foresees this project supporting more (new) development in the future. Her family expressed frustration with the ongoing development of the Kōloa-Po'ipū area. Kukui'ula has especially brought out a lot of negative sentiments from the community.
 - c. Mr. Rupert Rowe states that, “the traditional cultural practices are affected by population growth in the project area: All the fishing in this area is not the way it once was before we could fill a couple coolers. Shoreline everything has changed. More people, the environment has changed and thus changed our culture.”

9.3 Recommendations

Several participants expressed concern that the proposed action for the Kōloa, Weliweli and Pā'ā *ahupua'a* may negatively impact Hawaiian and Kōloa community members' beliefs, resources and practices. A good faith effort to develop appropriate measures to address concerns and pay attention to the following recommendations may help mitigate potentially adverse effects of the proposed project on cultural, historic and natural resources in and near the project area. Based on the findings of this CIA, it is recommended that:

1. Based on the archival evidence and community consultation conducted for this assessment, it is possible that there are human skeletal remains as well as significant cultural and historic properties in the project area; it is therefore recommended that:
 - a. Cultural monitoring and continuous ongoing consultation with cultural and lineal descendants of the area be conducted during all phases of development including ground-breaking and construction;
 - b. Personnel involved in development activities be informed of the possibility of inadvertent cultural finds, including human remains. Should cultural or burial sites be identified during ground disturbance, all work should immediately cease, and the appropriate agencies notified pursuant to applicable law;
 - c. If human burials are found, cultural and lineal descendants of the area should be consulted with regard to burial treatment plans.
2. Generally, it is recommended that project proponents pursue proactive consultation with community members in the Kōloa area in order to address community concerns about

the impacts to the environment, access to Waitā Reservoir, view corridors, possible cultural finds and sites, etc., integrate preservation and restoration ideas into the design and construction of the annex before development begins, and to consider meaningful ways of benefiting/contributing to the local Kōloa community.

Section 10 References Cited

Alexander, Arthur, C.

1937 *Koloa Plantation 1835-1935*, Kauai Historical Society, Lihue, Kaua'i.

Bennett, Wendell C.

1931 *The Archaeology of Kaua'i*, Bernice P. Bishop Museum Bulletin 80, Honolulu, Hawai'i.

Bernard, Russell H.

2005 *Research Methods in Anthropology: Qualitative and Quantitative Approaches*. Fourth Addition. AltaMira Press, Walnut Creek, CA.

Boundary Commission

1874 "Boundary of the Ahupua'a of Kōloa," as published in the *Boundary Commission Report, Kauai, Vol. 1*, State Archives, Honolulu, HI.

Conde, Jesse C.

1993 "Fowler Locomotives in the Kingdom of Hawaii", as published in *The Narrow Gauge*, Alan Burgess, Editor, 22 Pevekil Road, Peterborough, PE 1 3PY, England

Creed, Victoria, Gerald Ida, and Hallett Hammatt

1995 An Archaeological Inventory Survey for Po'ipū Road Safety Improvements, Po'ipū, Kaua'i, (TMK: 2-8-15, 16, 17 & 18), Cultural Surveys Hawai'i, Kailua, Hawai'i.

Damon, Ethel M.

1931 *Koamalu: A Story of Pioneers on Kauai and of What They Built in that Island Garden*. Privately Published, Honolulu, Hawai'i.

Donohugh, Donald L.

2001 *The Story of Kōloa, A Kaua'i Plantation Town*, Mutual Publishing, Honolulu.

Dorrance, William H. and Francis S. Morgan

2000 *Sugar Islands: The 165-Year Story of Sugar in Hawaii*, Mutual Publishing, Honolulu.

Farley, J. K.

1907 "Notes on Maulili Pool, Kōloa", as published in *Thrum's Almanac 1907*, Honolulu.

Foote, Donald E., E. L. Hill, S. Nakamura and F. Stephens

1972 *Soil Survey of the Islands of Kaua'i, O'ahu, Maui, Moloka'i and Lana'i*, State of Hawaii, U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.

Foreign Testimony

1848 Foreign Testimony of Kuleana Claims to Quiet Land Titles in the Hawaii Islands, State of Hawaii Archives, Honolulu, HI.

Giambelluca, Thomas W., Michael A. Nullet and Thomas A. Schroeder

1986 *Rainfall Atlas of Hawai'i*, Department of Land and Natural Resources, Honolulu.

Hammatt, Hallett H.

2005 Archaeological Inventory Survey of an 8.15-acre Knudsen Trust Parcel, Kōloa Ahupua'a, Kona District, Island of Kaua'i TMK: (4) 2-8-004: por. 003 & 055. Cultural Surveys Hawaii, Inc., Kailua, Hawaii.

Hammatt, Hallett H. and David Shideler

2006 Cultural Impact Assessment for the Kukui'ula – Po'ipū Road 24-inch Sewer Line, Kōloa Ahupua'a, Kōloa District, Island of Kaua'i

Hammatt, Hallett H., R.M. Bordner and M. J. Tomonari-Tuggle

1978 Archaeological and Biological Survey of the Proposed Kīahuna Golf Village Area, Kōloa, Kona, Kaua'i Island, Hawai'i, A.R.C.H., Lāwa'i, Kaua'i.

Hammatt, Hallett H., William H. Folk, and Mark Stride

1991 Archaeological Inventory Survey of the Proposed Po'ipulani Golf Course and Residential Development, Kōloa, Kaua'i (Revised July 1991), CSH Inc., Kailua, Hawai'i.

Hammatt, Hallett H., Gerald K. Ida, Sarah Masciangelo, and William Folk

2004 Archaeological Inventory Survey for Parcel 30 of the Eric A. Knudsen Trust Lands, Kōloa Ahupua'a, Kona District, Kauai Island, TMK: (4) 2-8-014: 30, Cultural Surveys Hawaii, Inc., Kailua, Hawaii.

Hammatt, Hallett H, Dominique Cordy, Uta Rainalter, Paul Gomes, David W. Shideler, and William H. Folk

2005 Archaeological Inventory Survey and Data Recovery Of The Kiahuna Golf Village and KMP Development Project Parcels in Approximately 400 Acres at Kōloa Ahupua'a, Kona, Kaua'i Island, Cultural Surveys Hawai'i, Kailua, Hawai'i.

Handy, E. S. Craighill

1940 *The Hawaiian Planter, Volume 1*. Bishop Museum Bulletin No. 161, Bernice P. Bishop Museum, Honolulu.

Hill, Robert R., John E. Dockall and Hallett H. Hammatt

2005a Inventory Survey of an Approximately 10.6-Acre Parcel at Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-15: 43, 44, 82, Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.

Hill, Robert R., Todd Tulchin, Jon Tulchin, and Hallett H. Hammatt

2005b Archaeological Inventory Survey of an 8.633 Acre Parcel at Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-014: 001 Mauka Portion, Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.

2005c Inventory Survey of an Approximately 9.348-Acre Parcel at Kōloa, Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-009: 001, Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.

Judd, Bernice

1935 "Koloa, A Sketch of Its Development", as held within the *Kauai Historical Society Papers, Volume II*, Honolulu.

Kikuchi, William K.

- 1963 Archaeological Survey and Excavations on the Island of Kaua'i, Kona District, Unknown publisher.
- 1981 Reconnaissance Survey, Archaeological Sites Weliweli Tract, TMK 2-8-22, Por6, Kōloa District, Island of Kaua'i.

Lahainaluna Schools

- 1885 "Heiaus and Fishing Grounds [of Koloa, Kauai]", (translation), HMS 43, #17.

Mission Houses Museum

- 1970 *Missionary Album Sesquicentennial Edition 1820-1970*, published by the Hawaiian Mission Children's Society, Honolulu.

Mitchell, Auli'i, Rodney Chiogioji, Hallett H. Hammatt

- 2005a *Cultural Impact Assessment for an Approximately 203-Acre Parcel in Kōloa Ahupua'a, Kona District, Island of Kaua'i*, Cultural Surveys Hawai'i, Inc., Kailua.

Monsarrat, M.D.

- 1891 Map: Hawaii Territorial Survey, Koloa. "Traced from M.D. Monsarrat circa 1891 Government Survey Map 1694", by T. B. Butch and E. J. Grube, September 1918.

Native Register

- 1847 Native Register of Kuleana Claims to Quiet Land Titles in the Hawaii Islands, State of Hawaii Archives, Honolulu, HI.

Native Testimony

- 1847 Native Testimony of Kuleana Claims to Quiet Land Titles in the Hawaii Islands, State of Hawaii Archives, Honolulu, HI..

Palama, Stephen L., and Catherine Stauder

- 1973 The Archaeology of Kona, Kaua'i from the Ahupua'a of Kōloa to the Ahupua'a of Weliweli: Archaeological Reconnaissance of the Proposed Cane Haul Road to the Kōloa Mill for McBryde Sugar Co., Ltd., A.R.C.H., Lāwa'i, Kaua'i.

Pukui, Mary Kawena

- 1983 *Ōlelo No'ea. Hawaiian Proverbs & Poetical Sayings*. Bernice P. Bishop Museum Special Publication No. 71, Bishop Museum Press, Honolulu.

Pukui, Mary Kawena, Samuel H. Elbert, and Ester T. Mookini

- 1974 *Place Names of Hawaii*, University of Hawaii Press, Honolulu.

Simonson, Mindy, Amy Hammermeister, Rosanna Runyon, and Hallett H. Hammatt

- 2009 Archaeological Data Recovery Report for a portion of the Eric A. Knudsen Trust Lands, Kōloa Ahupua'a, Kona District, Island of Kaua'i (TMK: (4) 2-8-014:019 por.), Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Thrum, Thomas G.

- 1907 "Heiaus and Heiau Sites Throughout the Hawaiian Islands", as published in *Hawaiian Almanac and Annual for 1908*, compiled by Thomas G. Thrum, Honolulu.

Townsend, John

- 1839 Narrative of a Journey Across the Rocky Mountains...and a Visit to the Sandwich Islands and Chile..., H. Perkins and Marvin, Boston.

Tulchin, Jon, and Hallett H. Hammatt

- 2006 Archaeological Data Recovery for SIHP No. 50-30-10-0362, at the proposed Starwood Vacation Ownership Development Project, Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: (4) 2-8-015: 43, 44, & 82, Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.
- 2009 Archaeological Inventory Survey for the proposed Kōloa-Po'ipū Regional Wastewater Reclamation Facility and Collection System, Kōloa, Weliweli, and Pa'a Ahupua'a, Kōloa District, Island of Kaua'i, TMK: [4] 2-8-004: por. 003; [4] 2-8-008: por. 001 & por. 036; [4] 2-8-009: por. 001; [4] 2-8-011: por. 001; [4] 2-8-014: por. 005, por. 019, por. 023, por. 030, & por. 037; [4] 2-8-022: por. 001, por. 011, por. 021, & por. 030; [4] 2-9-001: por. 001, Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Tulchin, Jon, Amy Hammermeister and Hallett H. Hammatt

- 2007 Archaeological Inventory Survey of an Approximately 10-Acre Knudsen Trust Parcel, Kōloa Ahupua'a, Kona District, Island of Kaua'i, TMK: [4] 2-8-011:001. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

U.S. Geological Survey

- 1910 (1912 Edition) Map: *Topographic Map of the Island of Kauai, Territory of Hawaii*, George Otis Smith, R.B. Marshall, U.S. Coast & Geodetic Survey, Washington, D.C.

Ulukau

- 2009 (Internet) <http://www.ulukau.org/cgi-bin/vicki?!=en>

University of Hawai'i at Mānoa. Center for Oral History

- 1988 Kōloa, an oral history of a Kaua'i community, Center for Oral History, University of Hawai'i at Mānoa, Honolulu.

Waihona 'Aina Corp.

- 2002 The Māhele Database and The Boundary Commission Database, as maintained by Project Director Victoria S. Creed, (Internet: www.waihona.com).

Walker, Allen T., and Paul H. Rosendahl

- 1990 Archaeological Data Recovery, Phase II, Hyatt Regency Kaua'i Mitigation Program, Paul H. Rosendahl, Inc., Hilo, Hawai'i.

Whitney, Samuel

- 1827 Journal of the Missionaries at Honolulu, February 17, 1821. Missionary Herald XVIII (June 1827:12).

Wichman, Frederick B.

- 1998 *Kauai: Ancient Place-Names and Their Stories*, University of Hawai'i Press, Honolulu.

Wichman, F.B. and C. Fayé

- 1991 *Polihale and Other Kaua'i Legends*, Bamboo Ridge Press, Honolulu, Hawai'i.

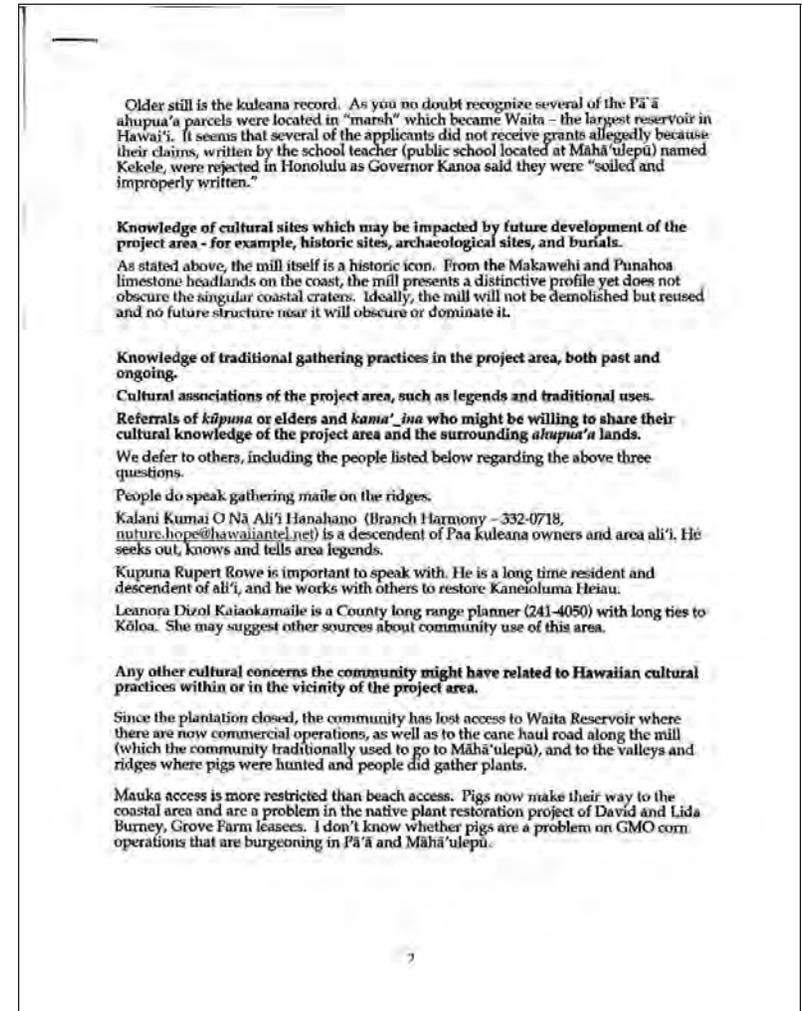
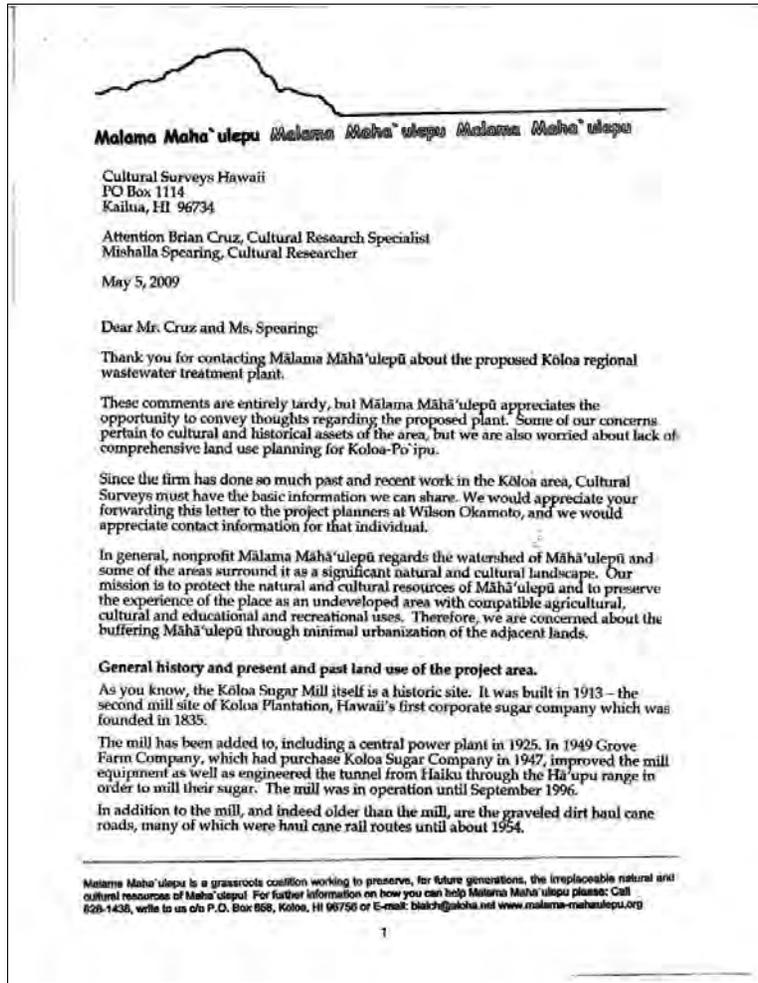
Wilcox, Carol

1996 *Sugar Water: Hawaii's Plantation Ditches*, University of Hawai'i Press, Honolulu.

Wilkes, Charles, Commander U.S.N.

1845 Narrative of the United States Exploring Expedition During the Years....., Lea and Blanchard, Philadelphia, PA.

Appendix A Mālama Māhā'ulepū ResponseLetter



Landowners and leasees are, of course, concerned about liability, vandalism and already commit money to management of the area. However, the exclusion to places formerly used is resented.

Additional concerns:

Visual concerns

In 1992 during the State Land Use District Boundary Review, the Office of State Planning proposed the redesignation of 1,517 acres of the Māhū'ulepū coastal area from agriculture to conservation. This included lands encircling the three landmark puu of Wanawana, Hūnūhūnū and Pūhū. After the winter rainy season, two of these craters hold intermittent lakes that are frequented by migratory water birds.

In addition 157 acres mauka (north and west) of Waita Reservoir were proposed to be added to the conservation district since the reservoir was "designated as a primary water bird habitat by Federal and State agencies and is used by all four endangered water birds in the state as well as the black crowned night heron and migratory shorebirds and ducks."

We are concerned about the visual impact of the proposed eastern pump station and the crater pump station on these puu, especially looking mauka from the coast to the mill. Another concern - environmental rather than visual is whether the plant's infiltration basin will attract water birds and is that at all dangerous?

Land use planning concerns:

The Kōloa-Po'ipū-Kalāheo development plan is over due to be updated. Several diverse uses are being proposed for the mill area. These include: taro processing at the mill, a basalt quarry proposed by Grace Pacific, 1000 acres of agriculture at Māhū'ulepū proposed by Grove Farm Company, power generation through wind, through solar and possibly through algae farming. Light industrial may be appropriate zoning for the mill area. However, there is a need for master plan for this important area as well as for the development plan update for Kōloa's undeveloped lands.

Thank you for your attention and work.

With aloha

Beryl Blitch, Coordinator

PS

Please visit our website www.malama-mahaulepu.org (preservation / proposed sanctuary) to read the National Park Service reconnaissance study for Māhū'ulepū and surroundings.

STATE LAND USE DISTRICT BOUNDARY REVIEW

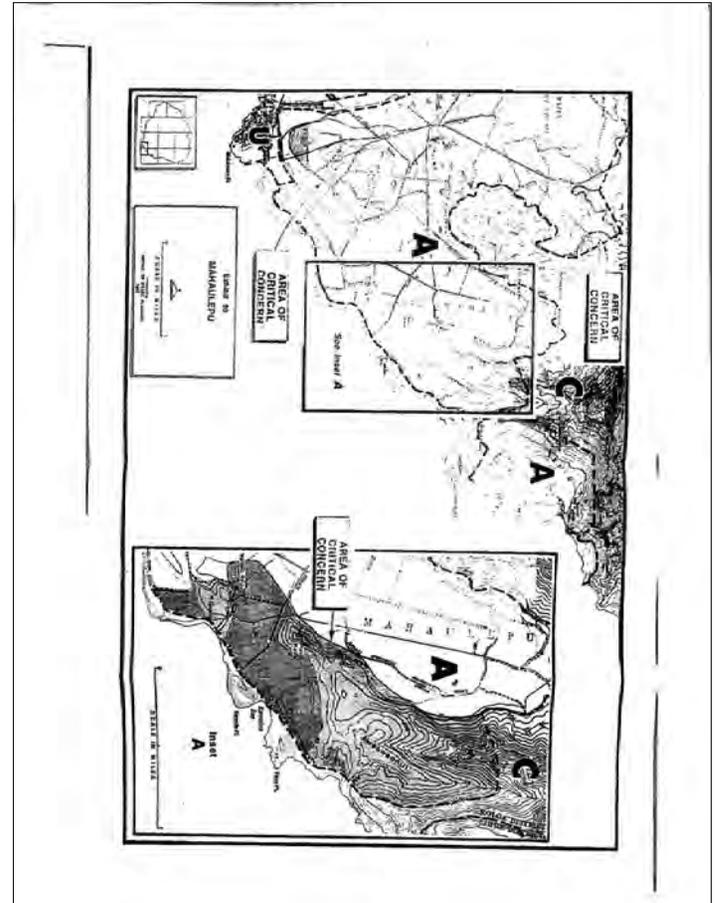
KAUAI

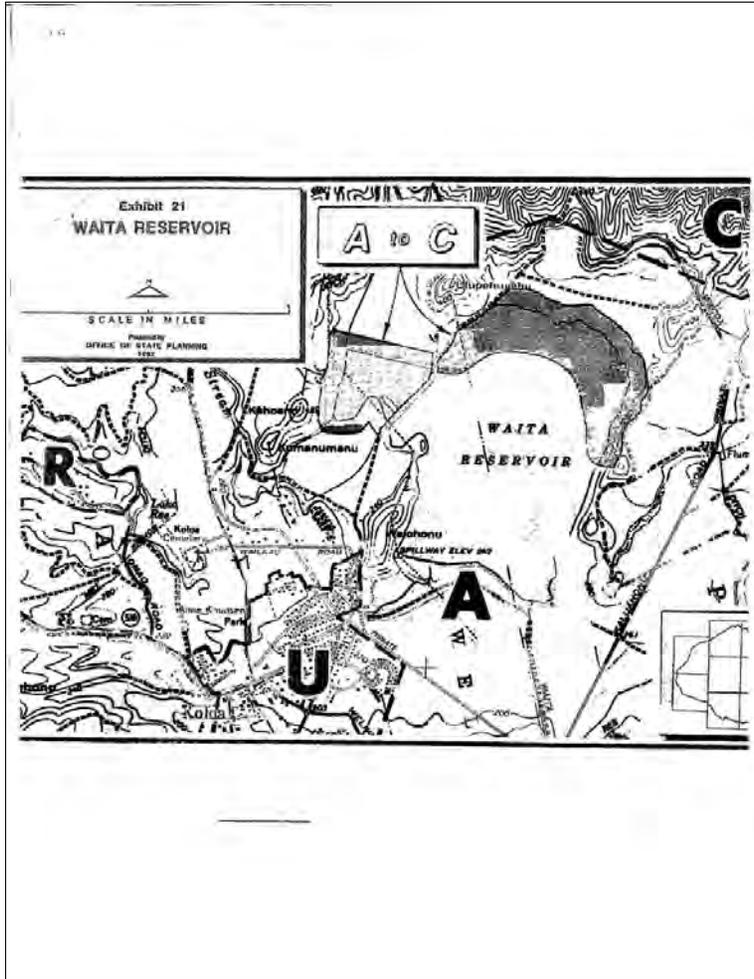


Office of the Governor
OFFICE OF STATE PLANNING

1992

- 15. Hanalei Coastline (21 acres) (U to C) Priority 2
Reclassification is recommended to protect significant scenic resources.
- 16. Hanalei and Molokai (792 acres) (A to U)
Reclassification of this area located inland and south of Hanalei Bay is intended to meet future urban land requirements. The project will contain commercial, residential, and industrial uses. This area is in proximity to existing urban areas and planned infrastructure improvements.
Kauai Lagoons Resort (240 acres) (A to U)
Reclassification is a housekeeping measure. Portions of this area are already in golf course use which is an urban-type use. The area is surrounded by Urban District lands.
Huleia Stream, Tributaries and Wetlands (807 acres) (A to C) Priority 1
Huleia Stream contains outstanding aquatic, riparian, and recreational stream resources. There are wetlands on both sides of the stream. This area is a large portion of the existing Huleia National Wildlife Refuge which is adjacent to the State Conservation District. Reclassification is also consistent with the County General Plan designation of "Open."
- 19. Kipu Kai Shoreline (65 acres) (A to C) Priority 2
This area is a high quality recreational resource designated "Open" by the County.
- 20. Mahaulepu Coastline (1,517 acres) (Area of Critical Concern)
This area is being identified to preserve coastal recreational resources, rare flora and fauna, unique limestone caves, lithified sand dunes and scenic, open space resources. The Mahaulepu shoreline is a significant undeveloped shoreline near Kauai's primary population centers and is an important resource for local residents. The sand dunes support some of the best native coastal vegetation on Kauai and include at least three rare native plant species. The coastline is a nesting site for wedge-tailed Shearwaters and white-tailed tropic birds, and a loafing area for Laysan albatross. Monk seals and green sea turtles have also been sighted in this area.
- 21. Waia Reservoir (123 acres) (A to C) Priority 1
Waia Reservoir is a large body of water of which the western portion is a natural wetland and the eastern portion is man-made. The reservoir as well as some of the surrounding lands are designated "Open" in the County General Plan. Waia has been designated a primary waterbird habitat by State and Federal agencies and is used by all four endangered waterbirds in the State, as well as the black-crowned night heron and migratory shorebirds and ducks.





Appendix B State Historic Preservation Department Response Letter



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
501 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
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LAILA W. THOLEN
GOVERNOR
OFFICE OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION

VERONICA S. LUNA
COMMISSIONER

AINI C. KAWAOKA
DEPUTY COMMISSIONER

OSWALD K. KAWAOKA
DEPUTY COMMISSIONER

CHRISTOPHER W. WATSON
DEPUTY COMMISSIONER

DAVID L. WATSON
DEPUTY COMMISSIONER

BARBARA S. SAY
DEPUTY COMMISSIONER

BARBARA S. SAY
DEPUTY COMMISSIONER

March 13, 2009 LOG NO: 2009.1360
DOC. NO: 0903PC007

MEMORANDUM

TO: Brian Kawika Cruz, Cultural Researcher
Cultural Surveys Hawai'i, P.O. Box 1114, Kailua, Hawaii 96734

FROM: Phyllis Coochie Cayan, History and Culture Branch Chief *P. Coochie Cayan*

Subject: KOLOA 29: A Cultural Impact Assessment (CIA) for the Proposed Po'ipu Regional Wastewater Reclamation Facility (Regional WRF) Project, Ahupua'a of Koloa, Wellwell, and Pa'a, Kona District, Island of Kauai.
TMK: [4] 2-09-001: portions of 001 and 002.

Mahalo for the opportunity to comment on the CIA for the proposed Po'ipu Regional Wastewater Reclamation Facility (WRF) and collection system which is intended to collect and treat wastewater associated with a service area encompassing the communities of Koloa Town, Po'ipu, and Kuku'ula.

SHPD's archaeologist Nancy McMahon is a prime resource person to consult with as she lives in Koloa and is familiar with those areas (i.e., burials, sites). You may want to speak with Nancy directly at SHPD phone 808-892-8021 about the proposed project area for any potential impacts to cultural sites.

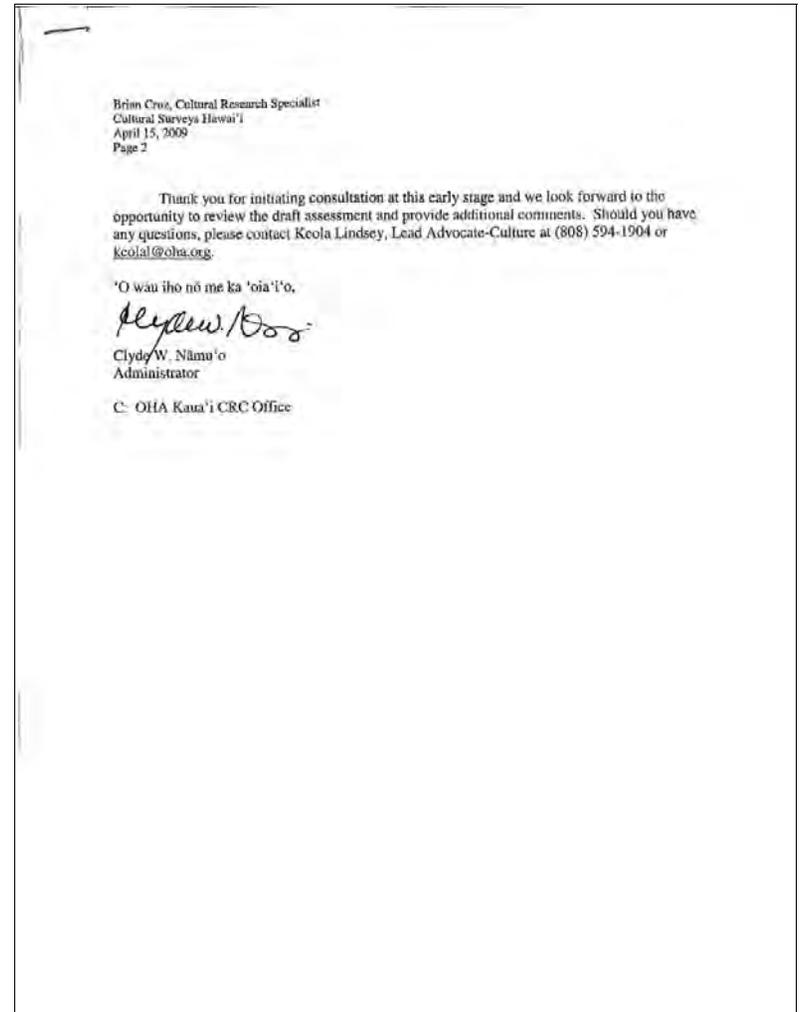
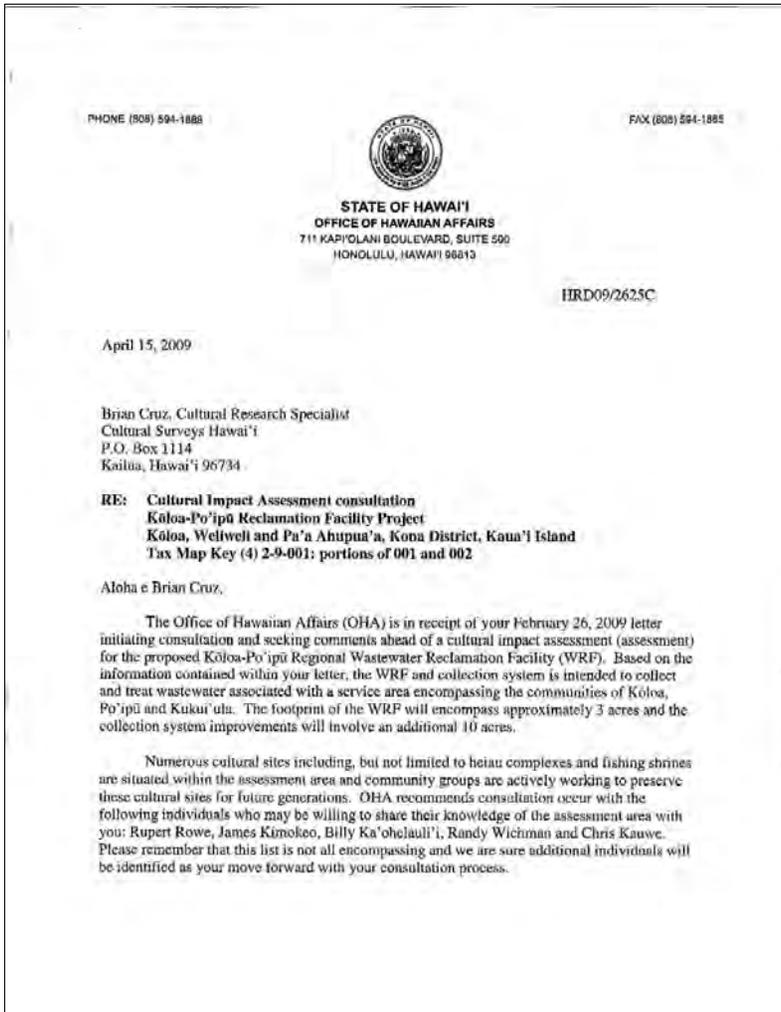
Other folks/groups you may want to contact regarding any impacts on cultural activities in the proposed area are:

- Kauai Museum
- Na Kupuna at Alii Like Inc. (Lihue Unit)
- John Kruse, Kauai Niihau Islands Burial Council member, phone 808-241-6235
- C. Kumano Aipoalani, chairman, Kauai Niihau Islands Burial Council ckaiipoalani@hawaiiantel.net
- Aunty Barbara Say, Kauai Niihau Islands Burial Council member, 294 Makani Rd. Kapaa 96748

Hopefully you will talk story these folks and get information or referrals who of any traditional or cultural practices in the project area. Any questions, please call me at 808-892-8015 or via email at Phyllis.L.Cayan@hawaii.gov

c: Pua Aiu, Ph.D., Administrator
Nancy McMahon, SHPO Deputy
C. Kumano Aipoalani, Chairman, KNIBC
Barbara Say, KNIBC commissioner

Appendix C Office of Hawaiian Affairs Response Letter



Appendix G

*Air Quality Study for the Proposed Koloa-Poipu Regional
Wastewater Reclamation Facility Project*

B.D. Neal and Associates

February 2009

Draft

**AIR QUALITY STUDY
FOR THE PROPOSED
KOLOA-POIPU REGIONAL WASTEWATER
RECLAMATION FACILITY PROJECT**

KAUAI, HAWAII

Prepared for:
Wilson Okamoto Corporation

February 2009



B.D. NEAL & ASSOCIATES

*Applied Meteorology * Air Quality * Computer Science*

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5 Estimated Air Pollution Emissions from Emergency Diesel Generator at Koloa-Poipu Regional Wastewater Reclamation Facility Project

1.0 SUMMARY

HOH Utilities is proposing to develop the Koloa-Poipu Regional Wastewater Reclamation Facility (WRF) near Koloa, Kauai. In addition to the WRF, which will be located at the existing former Koloa Mill site, the proposed project will include a wastewater collection system and three pumping stations in the Koloa/Poipu area. This study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed facilities and suggests mitigative measures to reduce any potential air quality impacts where possible and appropriate.

Both federal and state standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawaii air quality standards are comparable to the national standards except those for nitrogen dioxide and carbon monoxide which are more stringent than the national standards. State and federal ambient air quality standards do not generally protect the public from nuisance odor issues. The standards are primarily intended to provide health protection for sensitive elements of the population. Nuisance odor concentrations typically occur at even lower concentrations.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the Koloa/Poipu area is very much affected by the topography of the island and its coastal situation. Winds are predominantly trade winds from the east

northeast except for occasional periods when kona storms may generate strong winds from the south or when the trade winds are weak and landbreeze-seabreeze or drainage flow circulations may develop. Wind speeds average about 13 miles per hour providing relatively good ventilation much of the time. Temperatures in the area are generally very moderate with average daily temperatures ranging from about 68°F to 81°F. Average annual rainfall in the project area amounts to about 40 to 45 inches with summer months being the driest.

Although there is very little air quality data available from the Department of Health for the island of Kauai, the present air quality of the project area appears to be reasonably good. Based on the information available, it appears likely that all national air quality standards are currently being met, although occasional exceedances of the more stringent state standards for carbon monoxide may occur near congested roadway intersections.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short- and/or long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of

active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

After construction, plant operations will result in only minor emissions of air pollution. An onsite emergency diesel generator will operate only occasionally, resulting in relatively small amounts of sulfur oxides, nitrogen oxides, carbon monoxide, organic compounds and particulate. Treatment and reclamation of wastewater will be continuous activities that may result in the emission of small amounts of odorous gases such as hydrogen sulfide, ammonia and/or volatile organic compounds. While areas to the southwest of the project site will be in the prevailing downwind direction from the wastewater reclamation facility, dilution and dispersion during trade wind conditions can be expected to rapidly decrease any nuisance odor concentrations with distance from the plant. It's probable that areas to the south rather than the southwest would potentially be most affected by any nuisance odor emissions during nighttime, light wind drainage flow conditions when dispersion conditions are less favorable. Project plans call for wastewater treatment tanks to either be enclosed or covered and treated with an odor control system. It is expected that this will substantially mitigate any

potential nuisance odor issues. Presently, areas surrounding the project site consist of vacant land. Maintaining compatible zoning and land uses in the project area would be advisable.

2.0 INTRODUCTION

HOH Utilities, LLC is proposing to develop the Koloa-Poipu Regional Wastewater Reclamation Facility (WRF) Project on an approximately 3-acre area within a portion of the existing former Koloa Mill site (see Figure 1 for project location). The project would also include a wastewater collection system with pumping stations located at three sites within the vicinity. The purpose of the project is to collect and treat wastewater associated with a service area encompassing the communities of Koloa Town, Poipu and Kukuila.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short- and long-term direct and indirect air quality impacts that could result from construction and use of the proposed facilities as planned. Measures to mitigate project impacts are suggested where possible and appropriate.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1

summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, national and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The Hawaii AAQS are in some cases considerably more stringent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit. The U.S. Environmental Protection Agency (EPA) is currently working on a plan to phase out the national 1-hour ozone standard in favor of the new (and more stringent) 8-hour standard.

The Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make the state standards essentially the same as the national limits. In 1993, the state also revised its particulate standards to follow those set by the federal government. During 1997, the federal government again revised its standards for particulate, but the new standards were challenged in federal court. A Supreme Court ruling was issued during February 2001, and as a result, the new standards for particulate were finally implemented during 2005. To date, the Hawaii Department of Health has not updated the state particulate standards. In September 2001, the state vacated the state 1-hour standard for ozone and an 8-hour standard was adopted.

During the latter part of 2008, EPA revised the standard for lead making the standard more stringent. So far, the Hawaii Department of Health has not revised the corresponding state standard for lead.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affects the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east of the islands. These tradewinds are one of the outstanding features of Kauai's climate along with equable temperatures from day to day and season to season and the marked variation in rainfall from the wet to the dry season and from place to place.

The nearest long-term wind data available for the project area are collected at the Lihue Airport located about 10 miles to the northeast of Poipu. These data are probably at least semi-representative of the project area. As indicated in Table 2, they indicate a mean annual wind speed of 12.8 mph and a northeast annual prevailing wind direction for this area of Kauai [1]. Monthly wind speeds and directions are similar to the annual averages. Winds from the south are infrequent occurring only a few days during the year and mostly in winter in association with kona storms.

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from stack sources. In Hawaii, the annual and daily variation of temperature depend to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. At nearby Lihue Airport, average annual daily minimum and maximum temperatures are 68°F and 81°F, respectively. The extreme minimum temperature on record is 50°F, and the extreme maximum is 90°F [1]. Temperatures at the project site are very similar.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is often measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In the project area, stability classes 5 or 6 can be expected to occasionally occur, developing during clear, calm nighttime or early morning hours when temperature inversions form due to radiational cooling or to drainage flow from the mountainous interior of the island. Stability classes 1 through 4 occur during the daytime, depending mainly on the amount of cloud cover

and incoming solar radiation and the onset and extent of the sea breeze.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights in Hawaii typically are above 3000 feet (1000 meters).

Rainfall can have a beneficial affect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Lihue area has a moderately wet climate. Normal annual rainfall for Lihue Airport is about 43 inches. Three-fourths of this total, on the average, falls during the wet season of October through April. Widespread rainstorms, which account for much of the precipitation, occur most frequently during this period. January is the wettest month, averaging over six inches [1]. Rainfall in the Poipu/Koloa area is similar.

5.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, industrial sources, agricultural operations and to a lesser extent by natural sources. Table 3 presents an air pollutant emission summary for the island of Kauai for calendar year 1993. The emission rates shown in the table pertain to manmade emissions only, i.e., emissions from natural sources are not included. As suggested in the table, much of the particulate emissions on Kauai originate from area sources, such as the mineral/aggregate products industry and agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and industrial boilers. Nitrogen oxides emissions emanate predominantly from area sources (mostly motor vehicle traffic), although industrial point sources also contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources.

Arterial roadways in the project area, such as Koloa Road, Maluhia Road, Poipu Road and Ala Kinoiki Road, presently carry moderate to heavy levels of vehicle traffic during peak traffic hours. Some of the emissions from motor vehicles using these roadways, primarily nitrogen oxides and carbon monoxide, will tend to be carried over portions the project site by the prevailing winds.

Sources of industrial air pollution are located at Port Allen, which is located about 8 miles to the west. These industrial sources emit sulfur dioxide, nitrogen oxides, particulate matter, carbon monoxide and other air pollutants. Prevailing winds from

the east or northeast will carry these emissions away from the project area most of the time.

Until recently, air pollution in the project area originating from agricultural sources could mainly be attributed to sugar cane operations. Emissions from both the mill and much of the canefield operations in the area have now been eliminated with the closure of the Koloa Sugar Mill. Minor emissions of dust may occur from farming and ranching activities.

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

The State Department of Health operates a network of air quality monitoring stations at various locations around the state, but very little data is available for the island of Kauai. Table 4 shows annual summaries of air quality measurements for particulate (as PM-10) that were made at Lihue for the period 2002 through 2006. These are the only published and most recent air quality monitoring data that are currently available for the project area. Annual second-highest 24-hour PM-10 concentrations (which are regulated by state and federal standards) ranged from 24 to 30 $\mu\text{g}/\text{m}^3$ between 2002 and 2006. Average annual concentrations ranged from 11 to 16 $\mu\text{g}/\text{m}^3$. All values reported were within the state and national AAQS.

Although very little ambient air quality data is available to characterize existing conditions, due to the relatively small number of emission sources in the project area, it is likely that all ambient air quality standards are currently being met except perhaps for small areas around industrial sources or near traffic congested locations.

6.0 SHORT-TERM IMPACTS OF PROJECT

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

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [2] has provided a rough

estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the project site would likely be somewhere near that level, depending on the amount of rainfall that occurs. In any case, State of Hawaii Air Pollution Control Regulations [3] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in construction areas from becoming significant sources of dust. In dust-prone or dust-sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas is often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions. Monitoring dust at the project property line could be considered to quantify and document the effectiveness of dust control measures.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Project construction activities may also obstruct the normal flow of traffic at times to such an extent that overall vehicular emissions in the project area will temporarily increase. The only means to alleviate this problem will be to attempt to keep roadways open during peak traffic hours and to move heavy construction equipment and workers to and from construction areas during periods of low traffic volume. Thus, most potential short-term air quality impacts from project construction can be mitigated.

7.0 LONG-TERM IMPACTS OF PROJECT

After construction is completed, use of the proposed facilities will result in only minor amounts of air pollution emissions. These emissions will occur in the form of exhaust emissions from occasional operation of the emergency diesel generator and as odorous emissions from wastewater treatment operations.

7.1 Emergency Diesel Generator

Operation of the onsite emergency diesel generator is expected to occur only a few hours per year during power outages and during scheduled testing and operation of the generator. The primary air pollutants in the exhaust will include nitrogen oxides (NO_x), sulfur oxides (SO_x), total organic compounds (TOC), carbon monoxide (CO), and particulates. There may also be some evaporative losses of TOC but these should be insignificant due to the low volatility of diesel fuel.

Table 5 shows an estimate of the annual emissions that would occur from the emergency diesel generator assuming 500 hp engine (which represents a moderate engine size) and 100 hours per year of operation. As indicated in the table, the annual emissions will be minimal. Any impacts on air quality from emergency generator operation should be negligible.

7.2 Wastewater Treatment Operations

Wastewater treatment plants generally are not considered significant sources of air pollution, but they can result in the release of small amounts of airborne odorous compounds. The types and amounts of compounds in the air are generally not considered hazardous to human health, but when they occur at sufficiently high concentrations at offsite locations, they can be detected by smell and potentially constitute a nuisance for nearby residents and businesses. Odorous compounds commonly associated with

wastewater treatment systems include hydrogen sulfide, ammonia and volatile organic compounds (VOC). These compounds are typically emitted into the atmosphere from wastewater collection, treatment and storage systems through volatilization at the liquid surface. Emissions can occur by diffusive or convective mechanisms, or both. The compounds volatilize, or diffuse into the air, in an attempt to reach equilibrium between aqueous and vapor phases. Convection occurs when air flows over the water surface, sweeping the vapors from the water surface into the air. The rate of volatilization relates directly to the speed of the air flow over the water surface. Other factors that can affect the rate of volatilization include wastewater surface area, temperature and turbulence; wastewater retention time; wastewater depth; the concentration of organic compounds in the wastewater and their physical properties; the presence of a mechanism that inhibits volatilization; and a competing mechanism, such as biodegradation.

Mathematical models are available to estimate volatilization rates at wastewater treatment facilities when very detailed information is available concerning the effluent, the plant design and the site characteristics. Such information is not currently available for this project, but even if it were, it is likely that such estimates would be of limited usefulness for evaluating the potential odor impacts of the facility. The uncertainty of the estimates combined with the uncertainties of atmospheric dispersion estimates and human odor response would make it difficult to quantitatively and accurately evaluate the odor potential of the proposed plant. A qualitative evaluation may provide the best results.

As suggested above, temperature is a factor in the rate of volatilization. Temperatures at the project site will be relatively warm, which will tend to promote volatilization. As indicated in Section 5, the average daily temperature can be expected to range from 68 to 81 degrees Fahrenheit. Winds at the site will be predominantly trade winds from the northeast with a mean speed of about 13 mph. The prevalent winds could potentially promote volatilization at the plant, but they will also tend to enhance the dilution and dispersion of the emissions at downwind locations. With trade wind conditions, emissions will be carried toward locations to the southwest of the project site. From an atmospheric dispersion perspective, it is probable that the worst case for offsite odor impacts will occur during nighttime situations when the trade winds are weak or absent and dispersion conditions are poor. During these conditions, there will likely be light drainage winds moving from the high terrain to the north toward locations to the south of the project site. Under trade wind conditions, it is estimated that concentrations will be diluted and dispersed by a factor of about 4,000 at a distance of 1,000 ft from the project site. During nighttime drainage flow conditions when the trade winds are weak or absent, concentrations at a distance of 1,000 ft will likely be reduced by a factor of only about 200.

Presently, the areas surrounding the old mill site are vacant lands. Nearest residential area is Poipu Aina Estates, which is a small subdivision located at a distance of about 3,000 ft to the southwest. Currently, the infrastructure for this subdivision is complete, but homes have not yet been built. This subdivision and other areas nearby will likely be downwind of the proposed wastewater treatment facility during the prevailing (trade wind) conditions, but it is probable that any odorous emissions reaching

these areas will be reduced below detection levels by dilution and dispersion.

Releases of odorous compounds into the atmosphere from wastewater treatment facilities can typically occur during various processing operations or as a result of evaporation and/or convection of air in contact with the waste water. The experience with the existing wastewater treatment facility at Poipu has been that any odor problems have primarily been associated with sludge processing. While the proposed facility will utilize treatment processes similar to the existing plant, the intention is to put as many of the treatment tanks as possible inside the existing bagasse building at the mill site. Further, any tanks located outside will be covered and the off-gas treated with an odor control system.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will

also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

After the proposed project is completed, any long-term impacts on air quality in the project area due to emissions from project-related facilities should be small. There will be minor emissions from periodic operation of the emergency diesel generator, and there will potentially be emissions of nuisance odorous compounds. Compatible location and plant design are important factors for mitigating or avoiding nuisance odor issues associated with wastewater treatment facilities. It is expected that enclosing many of the tanks in the bagasse building and covering and treating any outdoor tanks will substantially eliminate any nuisance odor issues associated with the facility. Nevertheless, it would probably be advisable to maintain compatible land uses around the project site. Adjacent areas

toward the south probably have the most potential to be affected by any odorous emissions during nighttime light wind situations when dispersion conditions are less favorable.

Ambient air quality standards are generally designed to protect human health and do not guard against nuisance odor issues. While the State of Hawaii does have an ambient air quality standard for hydrogen sulfide as indicated in Table 1, compliance with this standard at the facility property line will not necessarily prevent nuisance odor complaints at offsite locations. The Hawaii standard is set at a value of 35 micrograms per cubic meter for a one-hour average. Sensitive individuals can detect hydrogen sulfide at concentrations as low as 7 micrograms per cubic meter. Further, human odor response is nearly instantaneous. Concentrations averaged over a one-hour period will likely be comprised of several shorter periods of higher and lower concentrations.

REFERENCES

1. "Local Climatological Data, Annual Summary With Comparative Data, Lihue, Hawaii, 1992", U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service, National Climatic Center, Asheville, NC.
2. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Research Triangle Park, NC, January 1995.
3. State of Hawaii. Hawaii Administrative Rules, Chapter 11-60, Air Pollution Control.

Figure 1 - Project Location



Table 1
SUMMARY OF STATE OF HAWAII AND NATIONAL
AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	$\mu\text{g}/\text{m}^3$	Annual 24 Hours	- 150 ^a	- 150 ^b	50 150 ^b
Particulate Matter (<2.5 microns)	$\mu\text{g}/\text{m}^3$	Annual 24 Hours	15 ^c 35 ^d	15 ^c 35 ^d	- -
Sulfur Dioxide	$\mu\text{g}/\text{m}^3$	Annual 24 Hours 3 Hours	80 365 ^b -	- - 1300 ^b	80 365 ^b 1300 ^b
Nitrogen Dioxide	$\mu\text{g}/\text{m}^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours 1 Hour	10 ^b 40 ^b	- -	5 ^b 10 ^b
Ozone	$\mu\text{g}/\text{m}^3$	8 Hours 1 Hour	157 ^e 235 ^f	157 ^e 235 ^f	157 ^e -
Lead	$\mu\text{g}/\text{m}^3$	Calendar Quarter	0.15 ^g	0.15 ^g	1.5
Hydrogen Sulfide	$\mu\text{g}/\text{m}^3$	1 Hour	-	-	35 ^b

^a Not to be exceeded more than once per year on average over three years.

^b Not to be exceeded more than once per year.

^c Three-year average of the weighted annual arithmetic mean.

^d 98th percentile value averaged over three years.

^e Three-year average of fourth-highest daily 8-hour maximum.

^f Standard is attained when the expected number of exceedances is less than or equal to 1.

^g Rolling 3-month average.

Table 3
AIR POLLUTION EMISSIONS INVENTORY FOR
ISLAND OF KAUAI, 1993

Air Pollutant	Point Sources (tons/year)	Area Sources (tons/year)	Total (tons/year)
Particulate	614	4,817	5,431
Sulfur Oxides	703	nil	703
Nitrogen Oxides	4,072	7,054	11,126
Carbon Monoxide	2,315	11,974	14,289
Hydrocarbons	859	224	1,083

Source: Final Report, "Review, Revise and Update of the Hawaii Emissions Inventory Systems for the State of Hawaii", prepared for Hawaii Department of Health by J.L. Shoemaker & Associates, Inc., 1996

Table 2
MEAN WIND SPEED AND PREVAILING DIRECTION
FOR LIHUE AIRPORT, KAUAI

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Speed (mph)	11.3	12.0	12.8	13.7	13.4	13.6	14.1	13.4	12.1	11.9	12.7	12.2	12.8
Direction	NE	ENE	NE										

Notes: Mean wind speeds are based on 32 years of data. Mean wind direction based on 20 years of data.

Source: "Local Climatological Data, Annual Summary With Comparative Data, Lihue, Hawaii, 1999", U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service, National Climatic Center, Asheville, NC.

Table 4
ANNUAL SUMMARIES OF AIR QUALITY MEASUREMENTS FOR
MONITORING STATIONS NEAREST KOLOA-POIPU REGIONAL WRF PROJECT

Parameter / Location	2002	2003	2004	2005*	2006
Particulate (PM-10) / Lihue					
24-Hour Averaging Period:					
No. of Samples	56	61	52	221	365
Highest Concentration ($\mu\text{g}/\text{m}^3$)	27	31	28	30	34
2 nd Highest Concentration ($\mu\text{g}/\text{m}^3$)	24	27	24	28	30
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu\text{g}/\text{m}^3$)	14	16	16	14	11

*Continuous monitor installed 5/25/2005.

Source: State of Hawaii Department of Health, "Annual Summaries,
Hawaii Air Quality Data, 2002 - 2006"

Table 5
ESTIMATED AIR POLLUTION EMISSIONS FROM
EMERGENCY DIESEL GENERATOR AT KOLOA-POIPU REGIONAL
WASTEWATER RECLAMATION FACILITY^a

Air Pollutant	Emission Rate (tons/year)
Particulate	0.06
Sulfur Oxides	0.05
Carbon Monoxide	0.2
Total Organic Compounds	0.06
Nitrogen Oxides	0.8

^aBased on U.S. EPA emission factors for uncontrolled gasoline and diesel industrial engines [2]. Assumes 500 hp diesel engine and 100 hours per year of operation.

Appendix H

Noise Impact Assessment Report

Koloa-Poipu Wastewater Reclamation Facility Project

Koloa/Poipu, Kauai, Hawaii

D.L. Adams Associates, LTD.

March 2009



D. L. ADAMS ASSOCIATES, LTD.

Consultants in Acoustics and Performing Arts Technologies

**Noise Impact Assessment Report
Koloa - Poipu Wastewater Reclamation Facility Project
Koloa/Poipu, Kauai, Hawaii**

August 2009

DLAA Project No. 08-15

Prepared for:
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1.0 EXECUTIVE SUMMARY

- 1.1** The proposed Koloa-Poipu Regional Wastewater Reclamation Facility Project consists of the development of a regional wastewater reclamation facility and associated wastewater collection system. The proposed project, located in the Koloa-Poipu region on the south shore of the Island of Kauai, is intended to collect and treat wastewater associated with a service area encompassing the communities of Koloa Town, Poipu, and Kukuiula. In addition to the Regional Wastewater Reclamation Facility (WRF), four wastewater pump stations (WWPS) and associated gravity lines and force mains would be constructed under this project. Figure 1 shows a map of the project area.
- 1.2** The proposed sites for the WRF and WWPS are vacant and surrounded by undeveloped, residential, commercial, or agriculturally zoned land. The project sites currently experiences relatively low ambient noise levels that are typical of a rural environment. Long term noise measurements conducted in four locations show existing Day-Night Levels, L_{dn} , that range from 57 dBA to 61 dBA.
- 1.3** Construction of the Regional WRF and the four pumping stations will involve excavation, grading, and other typical construction activities. Construction of sewer lines and gravity mains will involve cutting of existing pavement, trenching, grading, laying of water lines, paving, filling, and movement of construction vehicles. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process. Noise levels are expected to exceed both daytime and nighttime limits and a permit must be obtained from the State DOH to allow the operation of construction equipment. Most of the facilities are surrounded by agricultural land and are not considered noise sensitive. However, the Koloa and Villages WWPS are located adjacent to commercial or residential areas which may be impacted by construction noise. The various wastewater collection system lines are proposed to be routed within private property, along several county roads, and through private agricultural land. However, properties along Poipu Road near the proposed Villages WWPS and along the mauka end of Weliweli Road at the Koloa Road intersection are commercial and residential. These areas can be considered noise sensitive and will be impacted by nearby construction noise.
- 1.4** The various wastewater treatment processes will incorporate stationary and non-stationary mechanical equipment during the treatment from wastewater to R-1 reclaimed water. Pumps, blowers, and emergency generators will likely be the loudest equipment installed at the regional facility. A sound propagation model was developed for the proposed Regional WRF in order to estimate future noise levels at the property line. It is expected that mechanical noise will exceed the State DOH property line noise limits without noise mitigation. Therefore, mitigation of mechanical noise to meet the State DOH maximum permissible noise limits should be incorporated into the project design.
- 1.5** The four wastewater pumping stations will also incorporate stationary and non-stationary mechanical equipment to convey the flow of wastewater to the

Regional WRF. The emergency generators will be the loudest equipment installed at the facilities and must meet the State noise rules during monthly testing. Submersible pumps and blowers will also be a source of noise at the WWPSs and must meet the State noise rules. It is expected that mechanical noise from the emergency generators will exceed the State DOH property line noise limits during monthly testing. Therefore, mitigation of mechanical noise to meet the State DOH maximum permissible noise limits should be incorporated into the project design.

- 1.6** A traffic study was not conducted for this project. However, it is expected that traffic levels in the future will not be affected by the installation of the Regional WRF and associated collection system. Therefore, a future traffic noise impact due to the project is not expected. During the construction period however, residences in the surrounding area may experience heavier traffic due to the re-routing of vehicles away from the construction site. The increase in traffic will be short term and only during the construction period.

2.0 PROJECT DESCRIPTION

The proposed Koloa-Poipu Regional Wastewater Reclamation Facility Project consists of the development of a regional wastewater reclamation facility and associated wastewater collection system. The proposed project, located in the Koloa-Poipu region on the south shore of the Island of Kauai, is intended to collect and treat wastewater associated with a service area encompassing the communities of Koloa Town, Poipu, and Kukuiula. In addition to the Regional Wastewater Reclamation Facility (WRF), four wastewater pump stations (WWPS) and associated gravity lines and force mains would be constructed under this project. Figure 1 shows a map of the project area.

3.0 NOISE STANDARDS

Various local and federal agencies have established guidelines and standards for assessing environmental noise impacts and set noise limits as a function of land use. A brief description of common acoustic terminology used in these guidelines and standards is presented in Appendix A.

3.1 State of Hawaii, Community Noise Control

The State of Hawaii Community Noise Control Rule [Reference 1] defines three classes of zoning districts and specifies corresponding maximum permissible sound levels due to *stationary* noise sources such as air-conditioning units, exhaust systems, generators, compressors, pumps, etc. The Community Noise Control Rule does not address most *moving* sources, such as vehicular traffic noise, air traffic noise, or rail traffic noise. However, the Community Noise Control Rule does regulate noise related to agricultural, construction, and industrial activities, which may not be stationary.

The maximum permissible noise levels are enforced by the State Department of Health (DOH) for any location at or beyond the property line and shall not be exceeded for more than 10% of the time during any 20-minute period. The specified noise limits which apply are a function of the zoning and time of day as shown in Figure 2. With respect to mixed zoning districts, the rule specifies that the primary land use designation shall be used to determine the applicable zoning district class and the maximum permissible sound level. In determining the maximum permissible sound level, the background noise level is taken into account by the DOH.

3.2 U.S. Federal Highway Administration (FHWA)/Hawaii Department of Transportation (HDOT)

Although not applicable to short term traffic noise projects, the FHWA/HDOT traffic noise design limits can still be used to determine if a noise impact might occur. The FHWA defines four land use categories and assigns corresponding maximum hourly equivalent sound levels, $L_{eq(h)}$, for traffic noise exposure [Reference 2], which are listed in Figure 3. For example, Category B, defined as picnic and recreation areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals, has a corresponding maximum exterior L_{eq} of 67dBA and a maximum interior L_{eq} of 52 dBA. These limits are viewed as design goals, and

all projects meeting these limits are deemed in conformance with FHWA noise standards.

The HDOT has adopted FHWA's design goals for traffic noise exposure in its noise analysis and abatement policy [Reference 3]. According to the policy, a traffic noise impact occurs when the predicted traffic noise levels "approach" or exceed FHWA's design goals or when the predicted traffic noise levels "substantially exceed the existing noise levels." The policy also states that "approach" means at least 1 dB less than FHWA's design goals and "substantially exceed the existing noise levels" means an increase of at least 15 dB.

4.0 EXISTING ACOUSTICAL ENVIRONMENT

4.1 Noise Measurement Procedure

Ambient noise level measurements were conducted from January 14, 2009 to January 16, 2009 to assess the existing acoustical environment in four different locations within the project area. These locations are shown in Figure 4 and described below. Continuous, hourly, statistical sound levels were recorded for approximately 48 hours at each location. The measurements were taken using Larson-Davis Laboratories, Model 820, Type-1 Sound Level Meters together with Larson-Davis, Model 2560 Type-1 Microphones. Calibration was checked before and after the measurements with a Larson-Davis Model CAL200 calibrator. The sound level meters and the calibrator have been certified by the manufacturer within the recommended calibration period. The microphones were mounted on tripods, approximately 6 feet above grade. Windscreens covered the microphones during the entire measurement period. The sound level meter was secured in a weather resistant case at each location.

4.2 Noise Measurement Location and Results

Noise measurements were conducted near four of the five proposed new facility locations. GPS coordinates for each location is presented in Table 1. The existing conditions and ambient noise environment for each location are described below. The measured equivalent sound levels, L_{eq} , in A-weighted decibels (dBA) are graphically presented in Figure 5.

Table1. Noise Measurement Location Summary

ID	Location	GPS Coordinates
L1	Regional WRF	N21 54.028 W159 26.774
L2	Eastern WWPS	N21 52.837 W159 26.226
L3	Villages WWPS	N21 52.815 W159 27.545
L4	Koloa WWPS	N21 54.132 W159 27.741

4.2.1 Regional Wastewater Reclamation Facility (WRF)

The proposed Regional WRF will be situated on an approximately 3 acres within a portion of the existing former Koloa Mill. The existing property consists predominantly of abandoned structures associated with the former mill operations and undeveloped land area. The areas surrounding the site

consist of mostly vacant agricultural land and an all-terrain vehicle (ATV) commercial operation. Future development plans for the former Mill site have not been determined, although possible plans may include using the area as a historic site, commercial or tourist area.

The hourly L_{eq} noise levels at the former Koloa Mill site generally range from 50 dBA to 55 dBA and the calculated day-night level, L_{dn} , for the measurements period is 61 dBA. An unknown noise source created an anomaly in the noise measurement data around 7:00 pm on January 14, 2008. In addition, a meter malfunction caused incomplete data to be collected after the second afternoon. These irregularities have been noted in Figure 5. Dominant noise sources at this site include environmental noises such as wind and birds. Secondary noise sources include light industrial uses at the former Mill site and infrequent vehicular traffic along the access road.

4.2.2 Koloa Wastewater Pumping Station (WWPS)

The proposed Koloa WWPS will be located on an undeveloped parcel situated near the southwest corner of the Weliweli Road and Waikomo Road intersection. The vacant parcel is surrounded by a residential community. The proposed WWPS will be situated approximately 100' to 200' from the nearest existing residences.

The hourly L_{eq} noise levels at the proposed Koloa WWPS site generally range from 50 dBA to 60 dBA and the calculated day-night level, L_{dn} , for the measurements period is 61 dBA. Dominant noise sources at this site include vehicular traffic noise from Weliweli and Waikomo Roads. Secondary noise sources include environmental noises such as wind and birds.

4.2.3 Villages Pumping Station (WWPS)

The proposed Villages WWPS will be located on an undeveloped site off of Hapa Road and adjacent to the existing Kiahuna Swim and Tennis Club. The currently vacant land mauka of the proposed site will likely be developed as a residential community in the future.

The hourly L_{eq} noise levels near the proposed Villages WWPS site generally range from 45 dBA to 60 dBA and the calculated day-night level, L_{dn} , for the measurements period is 57 dBA. Dominant noise sources at this site include traffic noise from Kiahuna Plantation Road and the adjacent commercial facility. Secondary noise sources include environmental noises such as wind and birds.

4.2.4 Eastern Pumping Station (WWPS)

The proposed Eastern WWPS will be situated adjacent to the existing packaged wastewater treatment plant (WWTP) which serves the Grand Hyatt Resort and Spa. The proposed site is currently vacant and is located just east of the Poipu Bay Golf Course.

The hourly L_{eq} noise levels near the proposed Eastern WWPS site generally range from 50 dBA to 60 dBA and the calculated day-night level, L_{dn} , for the measurements period is 62 dBA. Dominant noise sources at this site include environmental noises such as wind and birds. During the night time hours when ambient noise levels generally reduce significantly, noise levels did not drop below 50 dBA due to static mechanical noise from the adjacent WWTP. Secondary noise sources include traffic noise from Poipu Road, noise from the adjacent golf course.

4.2.5 Crater Pumping Station (WWPS)

The proposed Crater WWPS will be located within an undeveloped site east of the existing water tanks near Puuhi Reservoir. The area surrounding the site is zoned as agricultural.

Long term noise measurements were not conducted at the Crater WWPS site as the areas surrounding the site is not considered noise-sensitive. Dominant noise sources at this site likely include traffic noise from Weliweli Road, noise from occasional farming equipment and environmental sources such as birds and wind.

5.0 POTENTIAL NOISE IMPACTS

5.1 Project Construction Noise

5.1.1 Construction of Regional WRF and WWPS

Construction of the Regional WRF and the four pumping stations will involve excavation, grading, and other typical construction activities during construction. The various construction phases of the project may generate significant amounts of noise. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process. Typical ranges of construction equipment noise are shown in Figure 6. Earthmoving equipment, e.g., bulldozers and diesel-powered trucks, will probably be the loudest equipment used during construction, assuming that pile driving will not be required.

Most of the facilities are surrounded by agricultural land and are not considered noise sensitive. However, the Koloa and Villages WWPS are located adjacent to commercial or residential areas which may be impacted by construction noise. The State DOH states that the primary land use designation shall be used to determine the applicable zoning

district class. Maximum permissible noise levels are specified by the State DOH for daytime and nighttime hours, but ambient noise levels are also taken into account. Construction noise levels are expected to exceed both daytime and nighttime limits and a permit must be obtained from the State DOH to allow the operation of construction equipment.

5.1.2 Construction of Associated Wastewater Collection System Lines

Construction will involve cutting of existing pavement, trenching, grading, laying of water lines, paving, filling, movement of construction vehicles, and other typical construction activities during the installation of sewer lines and gravity mains. The various construction phases of the project may generate significant amounts of noise that could impact nearby businesses and residences. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process. Backhoes, front loaders, pavement cutters, trenchers, generators, and earthmoving equipment, e.g., bulldozers and diesel-powered trucks will probably be the loudest equipment used during construction.

The various wastewater collection system lines are proposed to be routed within private property as well as along several county roads such as Weliweli Road, Ala Kinoiki, Waikomo Road, Koloa Road, and Poipu Road. Most of these sewer lines will be routed through private agricultural land. However, properties along the mauka end of Weliweli Road at the Koloa Road intersection are mostly commercial and residential, where most structures are located within 30 feet of the road. There are also commercial structures located along Poipu Road near the proposed Villages WWPS. These areas can be considered noise sensitive and will be impacted by nearby construction noise. Construction noise levels during the installation of the sewer lines are expected to exceed both daytime and nighttime limits and a permit must be obtained from the State DOH to allow the operation of construction equipment. In cases where nighttime construction is expected, a variance must be obtained from the State DOH to allow the operation of a noise source outside of the hours specified by noise permit.

5.2 Project Generated Stationary Mechanical Noise and Compliance with State of Hawaii Community Noise Control Rule

5.2.1 Regional Wastewater Reclamation Facility (WRF)

An aerobic secondary process and aerobic sludge stabilization process have been selected for the Regional WRF facility. The secondary treatment process selected is the Moving Bed Biofilm Reactor (MBBR). Consideration will be given to include provisions to modify the process to a Moving Bed Biofilm Reactor/Integrated Fixed Film Activated Sludge (MBBR/IFAS) in the future. The various processes will incorporate stationary and non-stationary mechanical equipment during the treatment

from wastewater to R-1 reclaimed water. Pumps, blowers, and emergency generators will likely be the loudest equipment installed at the facilities. Noise from this equipment must meet the State noise rules, which stipulate maximum permissible noise limits at the property line. For areas zoned agricultural or industrial, the property line noise limits are 70 dBA during the day and night. .

A sound propagation model was developed for the proposed Regional WRF using the DataKustik CadnaA software program [Reference 4]. The model is based on generic sound data from various pieces of mechanical equipment proposed for the facility. The actual sound levels may be significantly higher or lower than the predicted levels. Noise generated by the mechanical equipment will depend on the specific manufacturer and/or model number, and the methods of noise mitigation implemented at the time of construction. Future noise levels were estimated at the property line of the Regional WRF. The following assumptions were made for the purpose of the developing the sound propagation model:

- The existing Bagasse building and an proposed extension will be used to house most of the noisy equipment, including the blowers, MBBR tanks, centrifuge, DAFT units, cloth filter units and pumps.
- The emergency generator will be housed in separate structure.
- The effluent plant water pump station will be housed in a portion of the office/lab building.
- Noise control methods (such as acoustical louvers, duct silencer, etc.) were *not* considered.

The results of the mechanical noise analysis for the Regional WRF have been presented as a noise contour map, as shown in Figure 7. The noise contours illustrate that mechanical noise will satisfy the State DOH noise limits at most points along the property line. It is expected that the State DOH maximum permissible noise limits will be met if mitigation measures are incorporated into the project design.

5.2.2 Waste Water Pumping Stations (WWPS)

The four wastewater pumping stations will also incorporate stationary and non-stationary mechanical equipment to convey the flow of wastewater to the Regional WRF. The emergency generators will be the loudest equipment installed at the facilities and must meet the State noise rules during monthly testing. Submersible pumps and blowers will also be a source of noise at the WWPSs and must meet the State noise rules. For areas zoned commercial, the property line noise limits are 60 dBA during the day and 50 dBA during the night time hours. For areas zoned residential, the property line noise limits are 55 dBA during the day and 45 dBA during the night time hours.

It is expected that mechanical noise from the emergency generators will exceed the State DOH property line noise limits during monthly testing. Therefore, mitigation of mechanical noise to meet the State DOH maximum permissible noise limits should be incorporated into the project design.

5.3 Vehicular Traffic Noise Impacts

A traffic study was not conducted for this project. However, it is expected that traffic levels in the future will not be affected by the installation of the Regional WRF and associated collection system. Therefore, a future traffic noise impact due to the project is not expected. During the construction period however, residences in the surrounding areas may experience heavier traffic due to the re-routing of vehicles away from the construction site. The increase in traffic will be short term and only during the construction period.

6.0 NOISE IMPACT MITIGATION

6.1 Mitigation of Construction Noise

In cases where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels [Reference 1], a permit must be obtained from the State DOH to allow the operation of vehicles, cranes, construction equipment, power tools, etc., which emit noise levels in excess of the "maximum permissible" levels.

In order for the State DOH to issue a construction noise permit, the Contractor must submit a noise permit application to the DOH, which describes the construction activities for the project. Prior to issuing the noise permit, the State DOH may require action by the Contractor to incorporate noise mitigation into the construction plan. The DOH may also require the Contractor to conduct noise monitoring or community meetings inviting the neighboring residents and business owners to discuss construction noise. The Contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc. However, the State DOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities.

Specific permit restrictions for construction activities [Reference 1] are:

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels ... before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday."

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels... before 9:00 a.m. and after 6:00 p.m. on Saturday."

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays."

The use of hoe rams and jack hammers 25 lbs. or larger, high pressure sprayers, chain saws, and pile drivers are restricted to 9:00 a.m. to 5:30 p.m., Monday through Friday. In addition, construction equipment and on-site vehicles or devices whose operations involve the exhausting of gas or air, excluding pile hammers and pneumatic hand tools weighing less than 15 pounds, must be equipped with mufflers [Reference 1].

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

6.2 Mitigation of Stationary Mechanical Noise

The design of the wastewater reclamation facility and pumping stations should give consideration to controlling noise emanating from mechanical equipment so as to comply with the State Department of Health Community Noise Control rules [Reference 1].

6.2.1 Mitigation of Noise Source

Mitigating noise at the source is the most effective form of noise control. The following table lists general methods for source control listed for the noisier pieces of mechanical equipment proposed for the Regional WRF and the four WWPS.

Table 2. WRF and WWPS - Noise Source Control Methods

Emergency Generator	<ul style="list-style-type: none"> · Install the emergency generator in a building. · Install a critical (or higher) grade exhaust muffler. · Install duct silencers and acoustical louvers at the air intake and discharge paths.
Blowers	<ul style="list-style-type: none"> · Install blowers with a pre-manufactured acoustical enclosure.
Pumps	<ul style="list-style-type: none"> · Enclose pumps in an equipment room or building.
Buildings	<ul style="list-style-type: none"> · Buildings which house noisy mechanical equipment should be constructed of materials that prevent the transmission of noise to the exterior, such as concrete or CMU block. · Acoustical louvers should be installed in all ventilation openings. · Doors should be sealed with head and jamb seals and door bottoms. · The interior of the mechanical rooms should be lined with sound absorptive material.

6.2.2 Mitigation of Noise Path

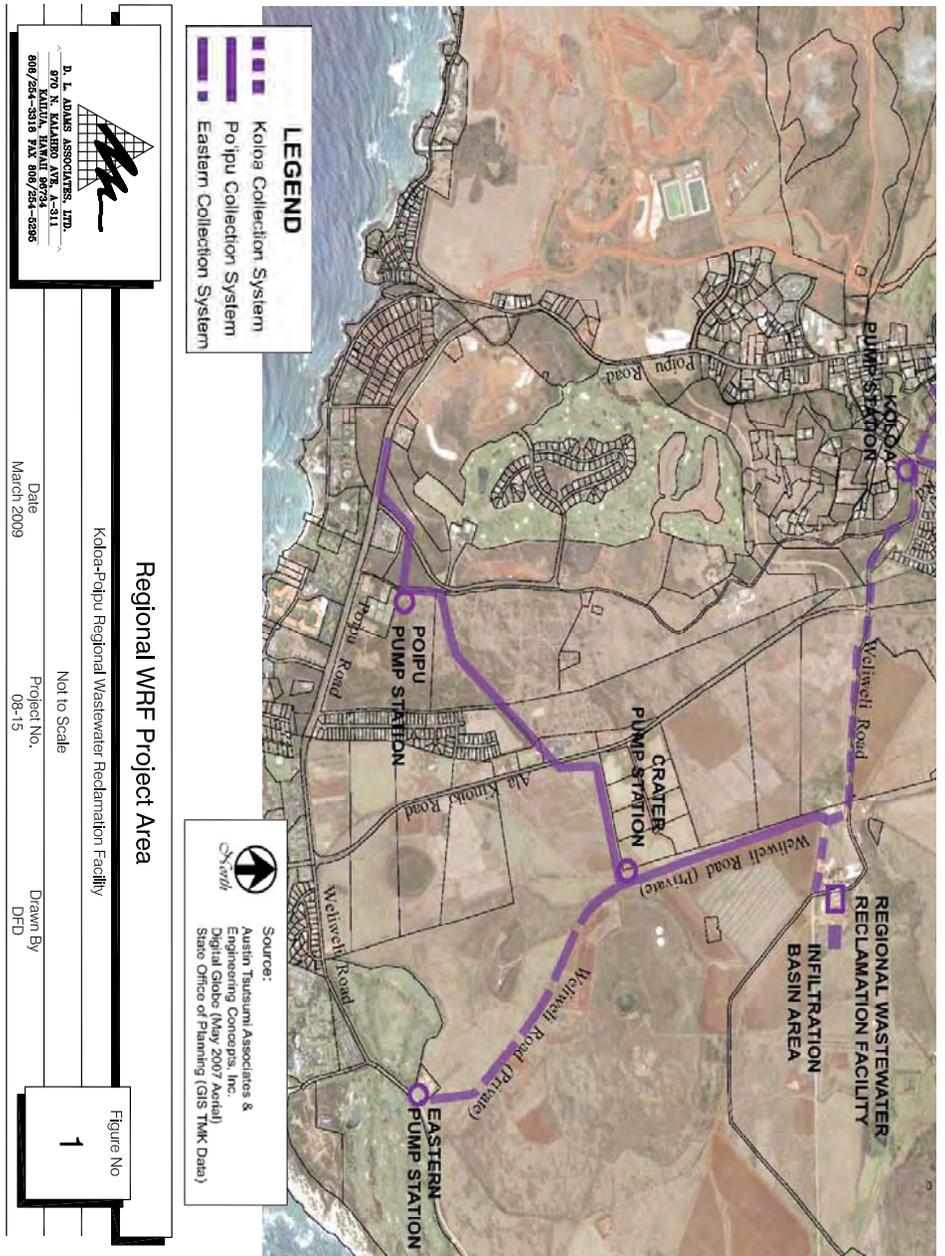
When source control measures are not sufficient to avoid a noise impact, path control measures must be considered. Permanent noise barriers can be installed around the perimeter of the WRF or WWPS to reduce mechanical noise at the adjacent noise sensitive properties. If properly constructed, the noise barrier can reduce sound levels by approximately 5 to 10 dB where the line of sight between the mechanical equipment and noise receptor is blocked. Prefabricated sound barrier walls are also available from a variety of manufacturers.

6.3 Mitigation of Vehicular Traffic Noise

Noise mitigation for vehicular traffic noise is not required as future traffic levels will not be affected by this project.

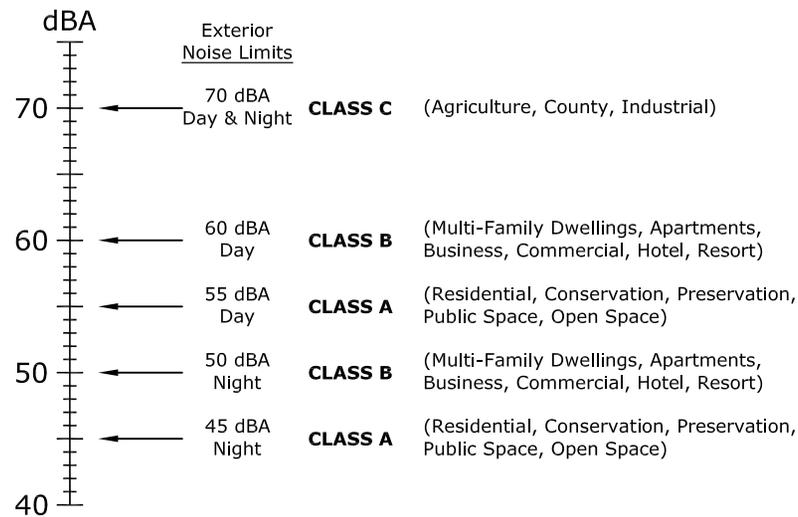
REFERENCES

1. Chapter 46, *Community Noise Control*, Department of Health, State of Hawaii, Administrative Rules, Title 11, September 23, 1996.
2. *Department of Transportation, Federal Highway Administration Procedures for Abatement of Highway Traffic Noise*, Title 23, CFR, Chapter 1, Subchapter J, Part 772, 38 FR 15953, June 19, 1973; Revised at 47 FR 29654, July 8, 1982.
3. *Federal Highway Administration's Traffic Noise Model*, FHWA-RD-77-108; U.S. Department of Transportation, December 1978.
4. DataKustik CadnaA software program, Version 3.7; DataKustik GmbH, 2007.

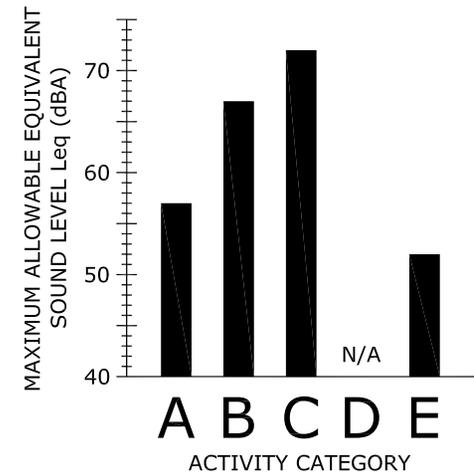


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Zoning District	Day Hours (7 AM to 10 PM)	Night Hours (10 PM to 7 AM)
CLASS A Residential, Conservation, Preservation, Public Space, Open Space	55 dBA (Exterior)	45 dBA (Exterior)
CLASS B Multi-Family Dwellings, Apartments, Business, Commercial, Hotel, Resort	60 dBA (Exterior)	50 dBA (Exterior)
CLASS C Agriculture, Country, Industrial	70 dBA (Exterior)	70 dBA (Exterior)



ACTIVITY CATEGORY	ACTIVITY CATEGORY DESCRIPTION	MAXIMUM EQUIVALENT SOUND LEVEL L _{eq} (h)
A	LANDS ON WHICH SERENITY AND QUIET ARE OF EXTRAORDINARY SIGNIFICANCE AND SERVE AN IMPORTANT PUBLIC NEED AND WHERE THE PRESERVATION OF THOSE QUALITIES IS ESSENTIAL IF THE AREA IS TO CONTINUE TO SERVE ITS INTENDED PURPOSE.	57 dBA (EXTERIOR)
B	PICNIC AREAS, RECREATION AREAS, PLAYGROUNDS, ACTIVE SPORT AREAS, PARKS, RESIDENCES, MOTELS, HOTELS, SCHOOLS, CHURCHES, LIBRARIES, AND HOSPITALS.	67 dBA (EXTERIOR)
C	DEVELOPED LANDS, PROPERTIES, OR ACTIVITIES NOT INCLUDED IN ACTIVITY CATEGORIES A OR B ABOVE.	72 dBA (EXTERIOR)
D	UNDEVELOPED LAND	N/A
E	RESIDENCES, MOTELS, HOTELS, PUBLIC MEETING ROOMS, SCHOOLS, CHURCHES, LIBRARIES, HOSPITALS, AND AUDITORIUMS.	52 dBA (INTERIOR)





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Hawaii Maximum Permissible Sound Levels for Various Zoning Districts

Koloa-Poipu Regional Wastewater Reclamation Facility

Not to Scale

Date: March 2009 Project No.: 08-15 Drawn By: DFD

Figure No

2



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Federal Highways Administration Recommended Equivalent Hourly Sound Levels Based on Land Use

Koloa-Poipu Regional Wastewater Reclamation Facility

Not to Scale

Date: March 2009 Project No.: 08-15 Drawn By: TRB

Figure No

3



REGIONAL WRF
(N21 54.028 W159 26.774)



EASTERN WWPS
(N21 52.837 W159 26.226)



VILLAGES WWPS
(N21 52.815 W159 27.545)



KOLOA WWPS
(N21 54.132 W159 27.741)

LEGEND

- Long Term Noise Measurement Locations
- Project Site



NORTH

Noise Measurement Locations

Koloa-Poipu Regional Wastewater Reclamation Facility

Not to Scale

Date
March 2009

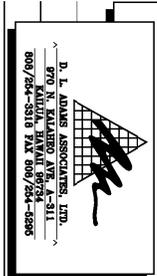
Project No.
08-15

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DFD

Figure No

4

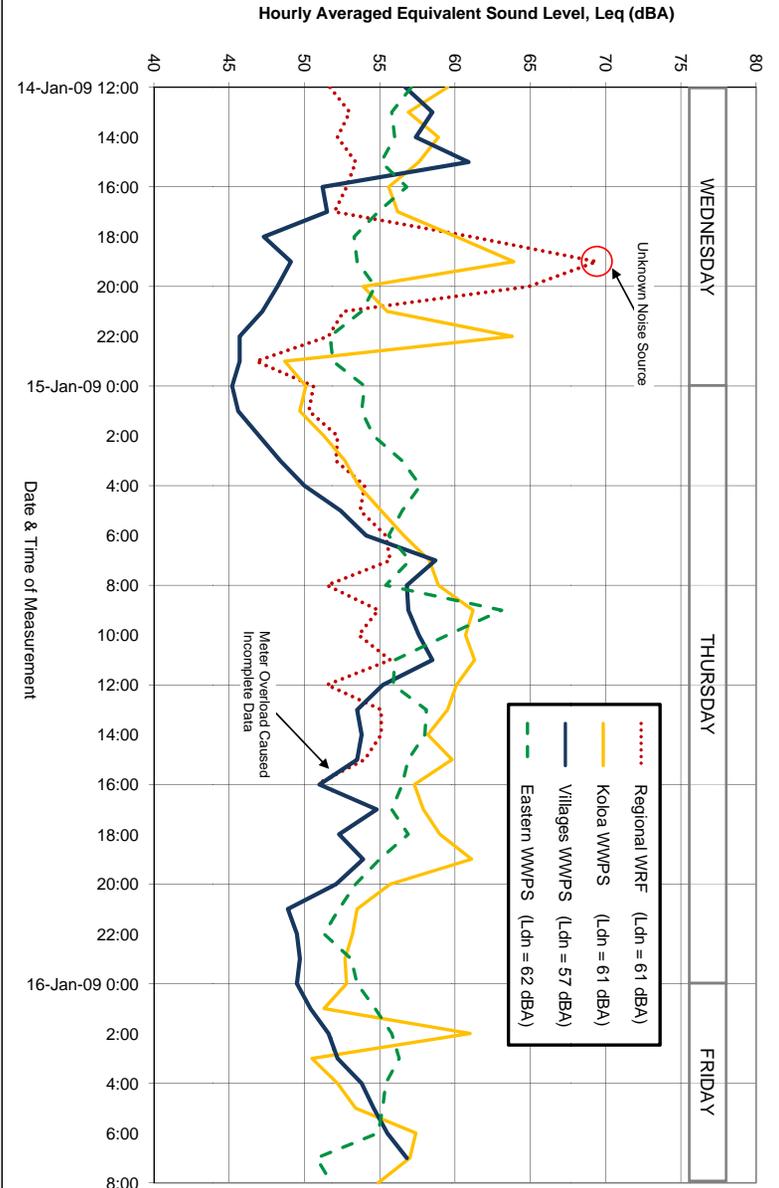
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Graph of Long Term Noise Measurements

March 2009
Date
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Figure No
5



NOISE LEVEL IN dBA AT 50 FEET (dBA)

60 70 80 90 100 110

		60	70	80	90	100	110
		EARTH MOVING	COMPACTORS (ROLLERS)		█		
	FRONT LOADERS		█	█			
	BACKHOES		█	█	█		
	TRACTORS			█	█	█	
	SCRAPERS GRADERS			█	█	█	
	PAVERS				█		
	TRUCKS				█	█	
	MATERIAL HANDLING	CONCRETE MIXERS			█	█	
	CONCRETE PUMPS				█		
	CRANES (MOVABLE)			█	█		
	CRANES (DERRICK)				█		
	STATIONARY	PUMPS		█			
	GENERATORS		█	█			
	COMPRESSORS			█	█		
	IMPACT EQUIPMENT	PNEUMATIC WRENCHES				█	
	JACK HAMMERS AND ROCK DRILLS			█	█	█	
	PILE DRIVERS (PEAKS)					█	
	OTHER	VIBRATORS		█	█		
	SAWS		█				

NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES

Typical Sound Levels from Construction Equipment

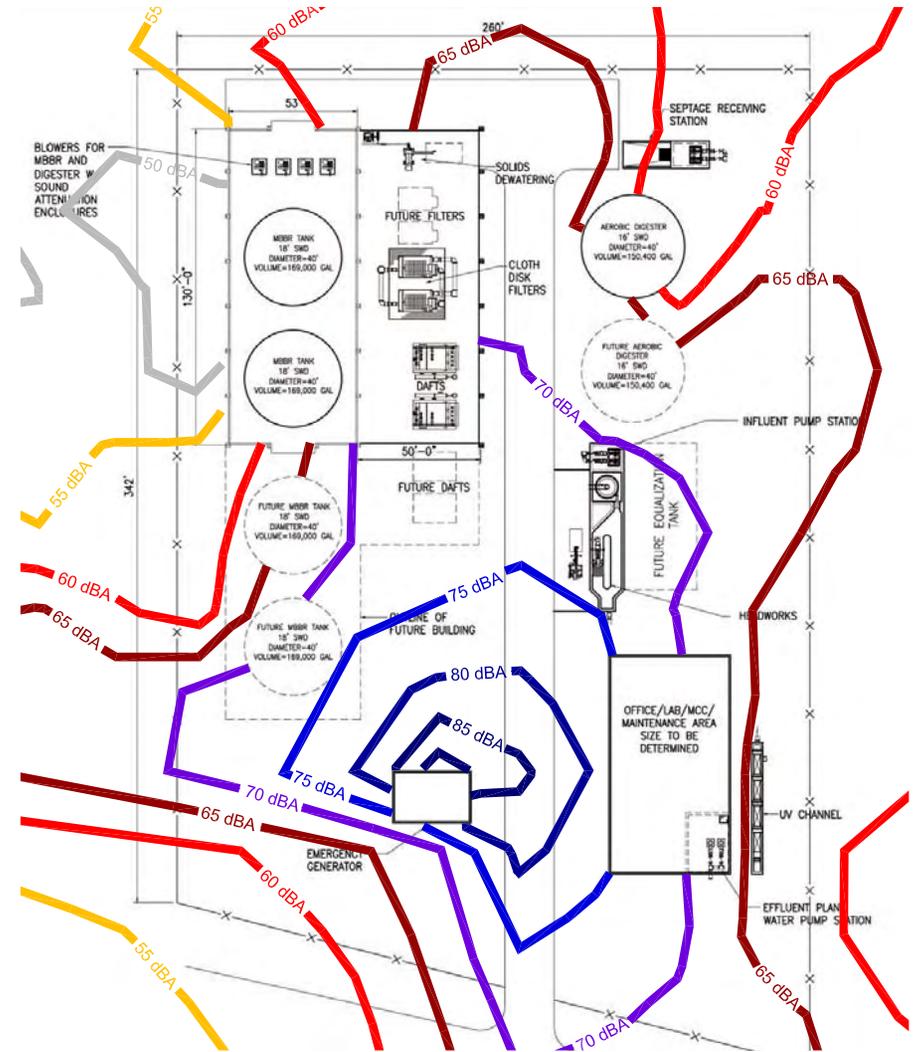
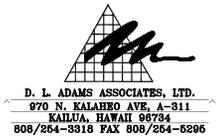
Koloa-Poipu Regional Wastewater Reclamation Facility

Figure No

6

Not to Scale

Date March 2009 Project No. 08-15 Drawn By TRB



Noise Contour Map for the Regional WRF

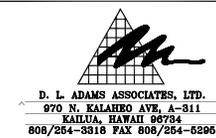
Koloa-Poipu Regional Wastewater Reclamation Facility

Figure No

7

Not to Scale

Date August 2009 Project No. 08-15 Drawn By DFD



APPENDIX A
Acoustic Terminology

Acoustic Terminology

Sound Pressure Level

Sound, or noise, is the term given to variations in air pressure that are capable of being detected by the human ear. Small fluctuations in atmospheric pressure (sound pressure) constitute the physical property measured with a sound pressure level meter. Because the human ear can detect variations in atmospheric pressure over such a large range of magnitudes, sound pressure is expressed on a logarithmic scale in units called decibels (dB). Noise is defined as “unwanted” sound.

Technically, sound pressure level (SPL) is defined as:

$$\text{SPL} = 20 \log (P/P_{\text{ref}}) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and P_{ref} is the reference pressure, 20 μPa, which is approximately the lowest sound pressure that can be detected by the human ear. For example:

- If P = 20 μPa, then SPL = 0 dB
- If P = 200 μPa, then SPL = 20 dB
- If P = 2000 μPa, then SPL = 40 dB

The sound pressure level that results from a combination of noise sources is not the arithmetic sum of the individual sound sources, but rather the logarithmic sum. For example, two sound levels of 50 dB produce a combined sound level of 53 dB, not 100 dB. Two sound levels of 40 and 50 dB produce a combined level of 50.4 dB.

Human sensitivity to changes in sound pressure level is highly individualized. Sensitivity to sound depends on frequency content, time of occurrence, duration, and psychological factors such as emotions and expectations. However, in general, a change of 1 or 2 dB in the level of sound is difficult for most people to detect. A 3 dB change is commonly taken as the smallest perceptible change and a 6 dB change corresponds to a noticeable change in loudness. A 10 dB increase or decrease in sound level corresponds to an approximate doubling or halving of loudness, respectively.

A-Weighted Sound Level

Studies have shown conclusively that at equal sound pressure levels, people are generally more sensitive to certain higher frequency sounds (such as made by speech, horns, and whistles) than most lower frequency sounds (such as made by motors and engines)¹ at the same level. To address this preferential response to frequency, the A-weighted scale was developed. The A-weighted scale adjusts the sound level in each frequency band in much the same manner that the

¹ D.W. Robinson and R.S. Dadson, “A Re-Determination of the Equal-Loudness Relations for Pure Tones,” *British Journal of Applied Physics*, vol. 7, pp. 166 - 181, 1956. (Adopted by the International Standards Organization as Recommendation R-226.

human auditory system does. Thus the A-weighted sound level (read as "dBA") becomes a single number that defines the level of a sound and has some correlation with the sensitivity of the human ear to that sound. Different sounds with the same A-weighted sound level are perceived as being equally loud. The A-weighted noise level is commonly used today in environmental noise analysis and in noise regulations. Typical values of the A-weighted sound level of various noise sources are shown in Figure A-1.

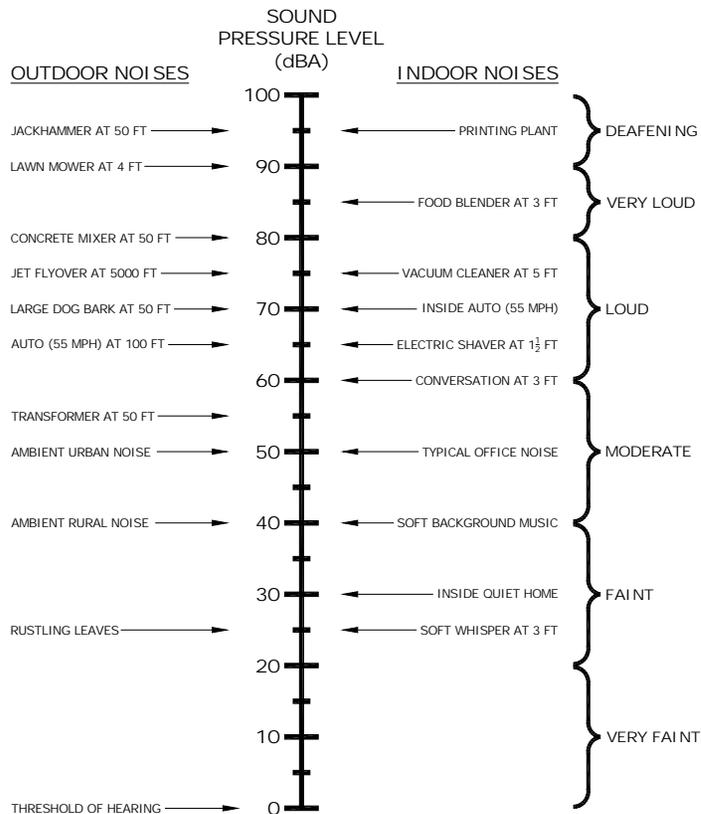


Figure A-1. Common Outdoor/Indoor Sound Levels

Equivalent Sound Level

The Equivalent Sound Level (L_{eq}) is a type of average which represents the steady level that, integrated over a time period, would produce the same energy as the actual signal. The actual instantaneous noise levels typically fluctuate above and below the measured L_{eq} during the measurement period. The A-weighted L_{eq} is a common index for measuring environmental noise. A graphical description of the equivalent sound level is shown in Figure A-2.

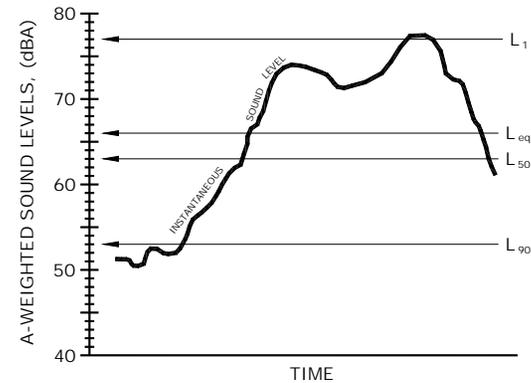


Figure A-2. Example Graph of Equivalent and Statistical Sound Levels

Statistical Sound Level

The sound levels of long-term noise producing activities such as traffic movement, aircraft operations, etc., can vary considerably with time. In order to obtain a single number rating of such a noise source, a statistically-based method of expressing sound or noise levels has been developed. It is known as the Exceedence Level, L_n . The L_n represents the sound level that is exceeded for n% of the measurement time period. For example, $L_{10} = 60$ dBA indicates that for the duration of the measurement period, the sound level exceeded 60 dBA 10% of the time. Typically, in noise regulations and standards, the specified time period is one hour. Commonly used Exceedence Levels include L_{01} , L_{10} , L_{50} , and L_{90} , which are widely used to assess community and environmental noise. A graphical description of the equivalent sound level is shown in Figure A-2.

Day-Night Equivalent Sound Level

The Day-Night Equivalent Sound Level, L_{dn} , is the Equivalent Sound Level, L_{eq} , measured over a 24-hour period. However, a 10 dB penalty is added to the noise levels recorded between 10 p.m. and 7 a.m. to account for people's higher sensitivity to noise at night when the background noise level is typically lower. The L_{dn} is a commonly used noise descriptor in assessing land use compatibility, and is widely used by federal and local agencies and standards organizations.

Appendix I

Phase I Environmental Site Assessment Report

Proposed Poipu Wastewater Treatment Plant

Property at Former Koloa Mill

Mahaulepu Road

Koloa, Hawaii

TMK (4) 2-9-001:001, TMK (4) 2-9-002:001 and 999

Myounghee Noh & Associates

July 1, 2009

**PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT
PROPOSED POIPU WASTEWATER TREATMENT PLANT
PROPERTY AT FORMER KŌLOA MILL
MAHAULEPU ROAD
KŌLOA, HAWAII
TMK (4) 2-9-001:001 AND TMK (4) 2-9-002:001**

MNA JOB NUMBER 50723

AUGUST 7, 2009



Myounghee Noh & Associates

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This Phase I ESA report is prepared for:

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

**PHASE I
ENVIRONMENTAL SITE ASSESSMENT REPORT
PROPOSED POIPU WASTEWATER TREATMENT PLANT
PROPERTY AT FORMER KŌLOA MILL
MAHAULEPU ROAD
KŌLOA, HAWAII
TMK (4) 2-9-001:001 AND TMK (4) 2-9-002:001**

255,031 sq. ft.

MNA Job No. 50723

August 7, 2009

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental professional* as defined in §312.10 of 40 CFR 312.

I have the specific qualifications based on education, training, and experience to assess a *property* of the nature, history, and setting of the subject *property*. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



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APPENDICES

Appendix A TRACK Info Services Assessment Report
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Appendix C Qualifications of Environmental Professional

LIST OF ABBREVIATIONS

AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESQG	Conditionally Exempt Small Quantity Generators
CORRACTS	RCRA Facilities that are undergoing "corrective action"
EC	Engineering Control
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
HDOH	Hawai'i Department of Health
HEER Office	Office of Hazard Evaluation and Emergency Response
IC	Institutional Control
LQG	Large Quantity Generator
LUST	Leaking Underground Storage Tank
KFD	Kaua'i Fire Department
KIUC	Kaua'i Island Utility Cooperative
MNA	Myounghee Noh & Associates, L.L.C.
NFRAP	CERCLIS No Further Remedial Action Planned
NLR	No Longer Regulated Generators
NPL	National Priorities List
PCBs	Polychlorinated Biphenyls
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
SQG	Small Quantity Generator
SHWB	Solid and Hazardous Waste Branch
TIS	TRACK Info Services
TMK	Tax Map Key
TSD	Treatment/Storage/Disposal
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank

1.0 EXECUTIVE SUMMARY

Myounghee Noh & Associates, L.L.C. (MNA), was retained to conduct a Phase I Environmental Site Assessment (ESA) for the subject property located at the former Kōloa Sugar Mill on Mahaulepu Road, Kōloa, Island of Kauai, Hawai'i, in March 2008. The subject property lies on two properties. TMK (4) 2-9-001:001 was owned by Visionary L.L.C., and TMK (4) 2-9-002:001 was owned by Grove Farm Company Inc. (Grove Farm) at the time of this Phase I ESA. This Phase I ESA was completed for Wilson Okamoto Corporation on behalf of HOH Utilities.

The purpose of this Phase I ESA is to identify *recognized environmental conditions* (RECs) at the subject property, with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. A Phase I ESA consists of four parts. Three of those parts are intended to collect information that will aid in the identification of RECs at the subject property. The information generating parts of the Phase I ESA are a review of state and federal environmental records, a site reconnaissance visit, and interviews with key site personal and other individuals with knowledge of the subject property. The fourth part of a Phase I ESA is a report that documents the collection of information about the subject property and evaluation of that information towards making a determination of the presence of RECs at the subject property.

1.1 FINDINGS

Hazardous materials and petroleum products have been present on the subject property since the construction of the sugar mill in 1913. Significant evidence from the investigation of other sugar mills in Hawai'i shows that hazardous materials and petroleum products were not managed in a manner that prevented their release to the soil and possibly groundwater of the mill sites and select areas of the surrounding agricultural fields (typically pesticide mixing areas). Information collected on this subject property leads to several areas of concern regarding the presence of *recognized environmental conditions*.

The subject property is composed of two non-contiguous land areas identified as Portion A and Portion B. Portion A comprises 1.98 acres and is composed of the bagasse house and surrounding area. Portion B comprises 1.89 acres and is composed of a section of the former washwater settling pond. Areas one through six within subject property Portion A and seven through ten adjacent to subject property Portion A (Figure 3) were identified as having significant findings that could lead to the identification of a REC. Area 11, adjacent to subject property Portion B (Figure 4) was identified as having a significant finding that could lead to the identification of a REC.

There is no indication that a release of the hazardous materials and petroleum products located in Area 1 has occurred or that a material threat of release exists. Therefore, this is not a *recognized environmental condition*.

Lead and acid from the batteries located in Area 2 have been released to the environment. Additionally, polychlorinated biphenyls (PCBs) may have been released from the electrical motors discarded in this area. Therefore, this is a *recognized environmental condition*.

Soil staining as well as the active release of petroleum products were observed in Area 3. Additionally, several drums located in this area were in poor condition, creating a material threat of release. Therefore, this is a *recognized environmental condition*.

Lead and acid from the batteries located in Area 4 have been released to the environment. Additionally, petroleum products and hazardous materials from aboveground storage tanks (ASTs) and stored or discarded equipment may have been released to the environment. Therefore, this is a *recognized environmental condition*.

There is no indication that a release of hazardous materials or petroleum products from the fire suppression pump system located in Area 5 has occurred or that a material threat of release exists. Therefore, this not a *recognized environmental condition*.

There is no indication that a release of hazardous materials and petroleum products from the AST farm located in Area 6 has occurred or that a material threat of release exists. Therefore, this not a *recognized environmental condition*.

Lead and acid from the batteries located in Area 7 have been released to the environment. Soil staining as well as the active release of petroleum products were also observed in this area. The proximity, topography, and soil type of the area make the migration of pollutants to the subject property a foreseeable possibility. As a result, this is a *recognized environmental condition*.

Petroleum products and possibly PCBs contained in the drum at the northwest corner of Area 8 have been released to the environment as evidenced by the oil on the top of the drum. Additionally, petroleum products and/or hazardous materials may have been released to the environment from a rusted out drum and AST located in this area. The proximity, topography, and soil type of the area make the migration of pollutants to the subject property a foreseeable possibility. As a result, this is a *recognized environmental condition*.

There is no indication that a release of hazardous materials or petroleum products from the transformers located in Area 9 has occurred or that a material threat of release exists. Therefore, this not a *recognized environmental condition*.

Petroleum products from equipment and ASTs in the mill, Area 10, have been released to the environment. Hazardous materials from this area may also have been released. Therefore, this is a *recognized environmental condition*.

The likely heavy use of recalcitrant agricultural chemicals and the petroleum product management practices typical of Hawai'i sugar mills may have resulted in the release of

hazardous materials or petroleum products to the soil of subject property Portion B. The sampling and analysis of settling pond soil in an area adjacent to Portion B has found the concentration of agricultural chemicals and petroleum product to be below the Hawai'i Department of Health 2009 action levels. This soil is believed to be representative of soil in subject property Portion B. As a result, this is not a *recognized environmental condition*.

There is a material threat of the release of a petroleum product and possibly PCBs from the pole-mounted transformer adjacent to subject property Portion B. Therefore, this is a *recognized environmental condition*.

The 1994 release of 5 gallons of oil in the mill is not likely to impact the subject property. As a result, this is not a *recognized environmental condition*.

The discharge of automotive wastes, machine fluids and lubricants, or equipment and vehicle wash water on the subject property such that these wastes caused a runoff into an adjacent sugarcane field is likely to have impacted the soil and possibly the groundwater of the subject property. As a result, this is a *recognized environmental condition*.

The discrepancy, in the area of the reported wash water settling pond, between the land use observed in the aerial photographs and that described by two interviewees is of note. Additionally, infrastructure supporting the idea that the area was used as a water receiving body of some kind is still present and visible. If the area was not used as a pond in the way described by interviewees it does not indicate that a release of hazardous materials or petroleum products did occur. Additionally, the MNA soil assessment report did not find contamination in surface and near surface soils in a portion of this area. This provides evidence that a widespread release of contaminants did not occur in this area. As a result, this not a *recognized environmental condition*.

1.2 RECOGNIZED ENVIRONMENTAL CONDITIONS

MNA performed a Phase I ESA in conformance with the scope and limitations of American Society for Testing and Materials (ASTM) E 1527-05 of the subject property located at the former Kōloa Sugar Mill, Mahaulepu Road, Kōloa, Island of Kaua'i, Hawai'i. Any exceptions to, or deletions from, this practice are described in Section 2.4. This assessment has revealed evidence of eight *recognized environmental conditions* in connection with the property including:

- The release of lead, acid, and possibly PCBs to the soil in Area 2 of the subject property
- The release of petroleum products to the soil in Area 3 of the subject property
- The release of lead, acid, and possibly petroleum products or hazardous materials to the soil in Area 4 of the subject property
- The release of lead, acid, and petroleum products to the soil in Area 7, adjacent to the subject property

- The release of petroleum products and possibly PCBs to the soil in Area 8, adjacent to the subject property
- The release of petroleum products and possibly hazardous materials to the building and possibly the soil of Area 10, adjacent to the subject property
- The material threat of a release of petroleum product and possibly PCBs from a pole-mounted transformer in Area 11, adjacent to the subject property
- Discharge of fluids from the maintenance shop, believed to have been located in Area 4 of the subject property

2.0 INTRODUCTION

This report presents the results of a Phase I Environmental Site Assessment (ESA) of the subject property located on Mahaulepu Road, Kōloa, Island of Kaua'i, Hawai'i. The location of the subject property is identified in Figure 1. This Phase I ESA was conducted by Myounghee Noh & Associates, L.L.C., herein referred to as MNA, for Wilson Okamoto Corporation on behalf of HOH Utilities, L.L.C. (HOH Utilities). At the time of this Phase I ESA, the subject property was owned by Grove Farm Company Inc. (Grove Farm) and its subsidiaries. Grove Farm leased the subject property to Jade Construction and Wa'alani Enterprises. Jade Construction operated a roof truss fabrication facility while Wa'alani Enterprises maintained a construction company equipment and materials baseyard.

2.1 PURPOSE

The purpose of this Phase I ESA is to identify any *recognized environmental conditions* (RECs) at the subject property, with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. This practice is intended to permit a user to satisfy one of the requirements to qualify for the *innocent landowner defense* to CERCLA liability, "all appropriate inquiry into the previous ownership and uses of the site consistent with good commercial or customary practice." The term *recognized environmental conditions* denotes the presence, or likely presence, of any hazardous substances or petroleum products on the property under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the property or into the ground, groundwater, or surface water of the property (ASTM International, 2005).

This report is part of the Phase I ESA conducted for the subject property. The assessment was conducted in accordance with the practices described in *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM International, 2005).

2.2 DETAILED SCOPE OF SERVICES

A Phase I ESA has four components: records review, site reconnaissance, interview, and report. MNA conducted this ESA using information sources with the potential to identify past or current releases of hazardous substances or petroleum products into the property.

2.2.1 Site History

Where available and as needed, MNA researched historical and current topographic maps, tax maps, fire insurance maps, and aerial photographs to identify previous and current uses of the property, adjoining properties, and the surrounding area.

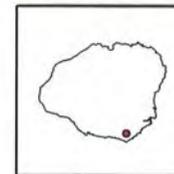
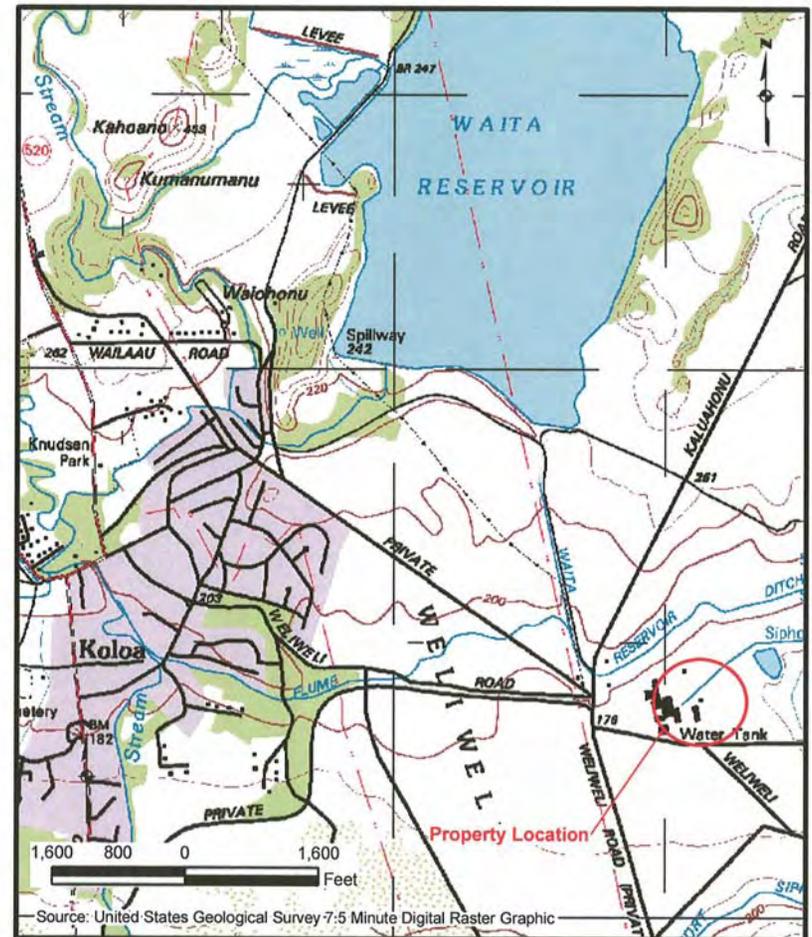


Figure 1. Site Location Map
Phase I Environmental Site Assessment Report
Proposed Poipu Wastewater Treatment Plant
Property at Former Kōloa Mill
Mahaulepu Road, Kōloa, Hawai'i
TMK (4) 2-9-01:001 and TMK (4) 2-9-002:001



50723

2.2.2 Regulatory Records

MNA examined government records with respect to environmental conditions, citations, complaints, and permits at the subject property, at adjoining properties, and within the surrounding area. MNA utilized a records search provided by TRACK Info Services, Inc. (TIS), to review records from the following federal and state programs. Additionally, MNA reviewed state environmental databases and case files from the Hawai'i Department of Health (HDOH) and Kaua'i Island Utility Cooperative (KIUC).

- National Priorities List (NPL)
- Delisted NPL
- Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action" (CORRACTS)
- RCRA-Treatment, Storage, & Disposal (TSD)
- Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS) List
- CERCLIS No Further Remedial Action Planned (NFRAP) List
- Solid Waste & Landfill
- Leaking Underground Storage Tank (LUST)
- RCRA-Violators/Enforcement
- Underground Storage Tank (UST)
- Emergency Response Notification System (ERNS)
- RCRA-Large Generator
- RCRA-Small Generator
- SPILLS-Hawai'i
- Land Use Controls

2.2.3 Site Reconnaissance

MNA performed a site reconnaissance to obtain information indicating the likelihood of contamination, to interview available site personnel, and to conduct a brief assessment of the adjoining properties. During the site reconnaissance, MNA looked for a variety of indicators of environmental hazard including but not limited to stained surface soil, dead or stressed vegetation, hazardous materials, aboveground and underground storage tanks, disposal areas, groundwater wells, drywells, and sumps. Sampling and testing of soil and groundwater were not part of this assessment.

2.2.4 Site Geology and Hydrogeology

MNA reviewed published information for the property and surrounding area on surface and subsurface conditions such as topography, drainage, surface water bodies, subsurface geology, and groundwater. MNA used this information to assess the potential for migration and impact of the subject property by releases of hazardous substances or petroleum products at off-site properties.

2.2.5 Data Evaluation and Reporting

MNA evaluated the information collected, and prepared this report as part of the assessment.

2.3 SIGNIFICANT ASSUMPTIONS

The conclusion presented in this report is based upon the assumption that reasonably ascertainable and relevant information pertaining to the environmental condition of the subject property was made available to MNA during the assessment. Information obtained from government agencies and other resources is presumed to be accurate and updated. Additionally, information collected in interviews is provided in "good faith" and believed to be true and accurate to the best knowledge of the interviewee.

2.4 LIMITATIONS AND EXCEPTIONS

The Phase I ESA provides a "snapshot" of the property conditions at the time of the assessment. Findings, opinions, and conclusions apply to property conditions existing at the time of the investigation and those reasonably foreseeable. They do not apply to conditions at, or changes to, the property, of which MNA is not aware, could not reasonably be aware, and has not had the opportunity to evaluate.

This report is based upon visual observations of the property and vicinity, interpretation of the available historical and regulatory information and documents reviewed, and interviews of individuals with knowledge of the subject or surrounding property. MNA cannot ensure the accuracy of the historical or regulatory information. This report is intended exclusively for the purpose outlined and applies only to the subject property.

This Phase I ESA excludes asbestos, lead paint, and investigation of geotechnical concerns. No surface or subsurface sampling was involved.

2.5 SPECIAL TERMS AND CONDITIONS

This Phase I ESA was conducted and prepared by MNA for the exclusive use of Wilson Okamoto Corporation and its representatives. This report shall not be relied upon or transferred to any other party without written authorization from Wilson Okamoto Corporation.

2.6 USER RELIANCE

This report is an instrument of service of MNA, which summarizes its findings and opinions with respect to *recognized environmental conditions* at the subject property. Findings and opinions are predicated on information that MNA obtained on the dates and from individuals stated herein, from public records reviewed, a site reconnaissance, and ancillary Phase I ESA activities. This assessment relies upon the accuracy and completeness of the information provided. The information obtained for this assessment

is used without extraordinary verification. It is possible that other information exists and is discovered, or environmental conditions change subsequent to submittal of this Phase I ESA report, to which MNA shall not be held responsible for exclusion.

3.0 SITE DESCRIPTION

This section contains location and legal description; site and vicinity general characteristics; current subject property use; structures, roads, and other improvements; past subject property use; and current and past use of adjoining properties.

3.1 LOCATION AND LEGAL DESCRIPTION

The subject property is located at Mahaulepu Road, Kōloa, Island of Kaua'i (Figure 1). The subject property consists of two non-contiguous portions of property identified by Tax Map Key (TMK) Island 4, Zone 2, Section 9, Plat 1, and Parcel 001; and TMK (4) 2-9-002:00. County tax records indicate TMK (4) 2-9-001:001 as 1,076 acres with agricultural zoning, and TMK (4) 2-9-002:001 as 2,371 acres with agriculture property zoning (County of Kaua'i, 2009). An area map is presented in Figure 2.

3.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The subject property is located in Kōloa on the island of Kaua'i. Captain James Cook rediscovered Kaua'i on January 19, 1778. Hawaiians did not have a written language so in an attempt to spell Kaua'i as the Hawaiians pronounced it, he named it Atouli.

Sugarcane was first grown in Kauai when Ladd and Company signed a lease for land in Kōloa in 1835. This first Kōloa plantation is located south of the newer Kōloa mill. Ladd and Company went bankrupt in 1845 and was bought by Dr. Robert W. Wood.

In 1906, Kōloa Marsh was converted into a reservoir in order to provide the mill with sufficient water. Kōloa Reservoir was the largest in the islands for several decades. It was later referred to as Waita Reservoir.

In 1902, McBride Sugar Company (McBride), a subsidiary of Alexander & Baldwin, built a new mill in Wahiawa east of Ele'ele. McBride improved facilities at Ele'ele landing by building a break wall, and dredging a harbor. In 1909, McBride changes the name to Port Allen. In 1913, Kōloa Plantation built a new, larger mill about a mile from Kōloa. The 1841 mill was shut down. By the end of World War One, the new Kōloa Plantation was producing 9,000 tons of sugar annually with profits of nearly \$300,000.



Figure 2. Area Map
Phase I Environmental Site Assessment Report
Proposed Poipu Wastewater Treatment Plant
Property at Former Kōloa Mill
Mahaulepu Road, Kōloa, Hawai'i
TMK (4) 2-9-01:001 and TMK (4) 2-9-002:001



Tractors were introduced in the 1920s for plowing and proved to be more efficient than Fowler plows. John Moir took over the plantation in 1922. In 1930, 18,833 tons of sugar were produced with a profit of only \$196,295 due to lower sugar prices. The plantation was considered medium sized and had fewer than 1,000 employees.

An industry-wide strike occurred in 1958, with a smaller strike in 1961. In 1974, Grove Farm leased its Kōloa lands to McBride. McBride transferred its best equipment to the Kōloa mill and upgraded the existing equipment. It also mechanized operations as much as possible and converted to a drip irrigation system.

In 1982, the sugarcane fields were damaged by Hurricane 'Iwa, but the industry continued and agriculture in the area was diversified into macadamia nuts, coffee, and other crops. A more severe storm, Hurricane Iniki, struck the area 1992. The coffee plants appeared to withstand the storms best. As a result, more coffee was planted and the sugar crops were abandoned. Alexander & Baldwin took over and expanded coffee cultivation and now markets the coffee as Kaua'i Coffee. McBride and the Kōloa mill shut down in 1996 (Donohugh, 2001).

3.2.1 Geology

Kaua'i is the fourth largest and by far the oldest of the main Hawaiian islands. It was formed from a single shield volcano that has been highly weathered and eroded to the point that the summit peak can be difficult to find.

The age of Kaua'i has transformed much of its surface lava flows into weathered soils lending the island more erosional landforms versus the volcanic landforms found on the younger Hawaiian islands (Morgan, 1996).

The subject property lies in an area underlain with Napali lavas, that following a long period of dormant volcanism were overlain with Kōloa series lavas. These flows were subsequently weathered to create the relatively thick soil horizons prevalent in the Kōloa area. The Kōloa lavas were relatively horizontal lavas making them less permeable than the Napali lavas (MacDonald, Abott, & Peterson, 1970)

The United States Department of Agriculture Natural Resources Conservation Service classifies the soil at the subject property as Waikomo stony silty clay. Typically, this soil type is composed of stony silty clay from 0 to 14 inches, stony silty clay loam from 14 to 20 inches, and bedrock from 20 to 30 inches. It is well drained and more than 80 inches from the water table (United States Department of Agriculture, 2008).

3.2.2 Hydrogeology

The Kōloa aquifer system of Kaua'i is composed of discontinuous high level perched aquifers in the relatively flat, olivine to nepheline basalt. These lavas overlay the more permeable Napali lavas that are the dominant underlying series on the island. The

perched Kōloa aquifers become basal along the coast. The principal water resource in the area is the deeper Napali aquifer, however some utilization of the upper aquifers has occurred. As is typical, the vulnerability of the upper aquifer to contamination is high (Mink & Lau, 1992). Groundwater in the lower aquifer in the area of the subject property is found at approximately 200 feet below the ground surface (United States Geological Survey, 2009).

Table 1 and Table 2 summarize the classification of the upper and lower aquifer in the vicinity of the subject property (Mink & Lau, 1992).

Table 1. Upper Aquifer Classification System

Aquifer Code	2010111
Island Code	2 - Kauai
Aquifer Sector	01 - Lihue
Aquifer System	01 - Kōloa
Aquifer Type, hydrogeology	1 - Basal
Aquifer Condition	1 - Unconfined
Aquifer Type, geology	1 - Flank, Horizontally Extensive Lavas
Status Code	21111
Development Stage	2 - Potential Use
Utility	1 - Drinking
Salinity (in mg/L Cl ⁻)	1 - Fresh (<250)
Uniqueness	1 - Irreplaceable
Vulnerability to Contamination	1 - High

Table 2. Lower Aquifer Classification System

Aquifer Code	2010122
Island Code	2 - Kauai
Aquifer Sector	01 - Lihue
Aquifer System	01 - Kōloa
Aquifer Type, hydrogeology	1 - Basal
Aquifer Condition	2 - Confined
Aquifer Type, geology	2 - Dike, Aquifers in Dike Compartments
Status Code	21113
Development Stage	2 - Potential Use
Utility	1 - Drinking
Salinity (in mg/L Cl ⁻)	1 - Fresh (<250)
Uniqueness	1 - Irreplaceable
Vulnerability to Contamination	3 - Low

3.3 CURRENT USE OF THE SUBJECT PROPERTY

At the time of this Phase I ESA, subject property Portion A was leased to Jade Construction and Wa'alani Enterprises. Subject property Portion B was vacant and

overgrown with guinea grass. Jade Construction utilized the former bagasse house for the construction of roof trusses. Wa'alani Enterprises is an earth moving and construction company that maintains a baseyard in the area surrounding the former scrap metal storage shed. The portion of their baseyard that is part of subject property Portion A is a vehicle, equipment, and drum storage area.

3.4 STRUCTURES, ROADS, AND OTHER IMPROVEMENTS

Subject property Portion A was improved with a concrete warehouse building used as a bagasse storage building (bagasse house) during mill operation. This area also contains a pump house, an aboveground storage tank for diesel, a water tank, six aboveground storage tanks of various sizes for bunker fuel, and an unpaved driveway with locking gate. The area is accessed from Mahaulepu Road, which is a private road, via Kōloa Bypass Road. During mill operation electricity was supplied to the bagasse house via the mill power station. Currently, there is no electricity, water, sewer, septic, phone, gas or other utility connection to the subject property Portion A. A site map of subject property Portion A is presented in Figure 3.

Subject property Portion B was accessed from Mahaulepu Road, which is a private road, via Kōloa Bypass Road. The unpaved driveway is accessed by a locked gate and is the same driveway as that used by Wa'alani Enterprises. An unpaved private road leads from the baseyard to Portion B. Subject property Portion B was formerly used as a sugar mill washwater settling pond. As a result, agricultural and landform improvements were likely made to the property but are not readily visible due to the dense tall vegetation on the property. Currently, there is no electricity, water, sewer, septic, phone, gas, or other utility connection to the subject property Portion B. A site map of subject property Portion B is presented in Figure 4.

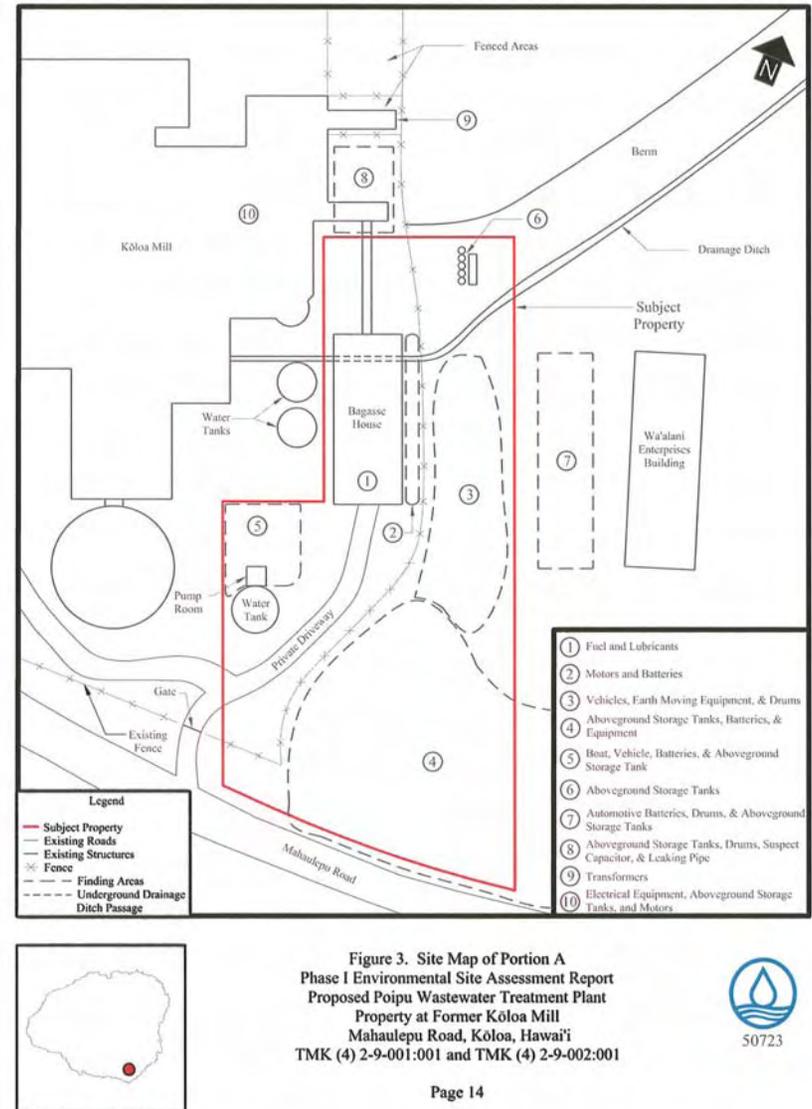
3.5 PAST USES OF THE SUBJECT PROPERTY

Information regarding past uses of the subject property was obtained from review of tax records (County of Kaua'i, 2009), historic topographic maps (TRACK Info Services, L.L.C., 2009), aerial photographs (R.M. Towill Corporation, 2008), and interviews. Fire insurance map coverage was unavailable for the subject property.

The subject property occupies a portion of two large parcels. Subject property Portion A occupies parts of two TMK parcels. Subject property portion A occupies,

- 48,644 square feet of TMK (4) 2-9-001:001 that totals 1,076.07 acres
- 37,681 square feet of TMK (4) 2-9-002:001 that totals 2,371.39 acres

for a total of 86,325 square feet (1.98 acres).



Subject property Portion B occupies 82,381 square feet (1.89 acres) of TMK (4) 2-9-002:001. The subject property occupies a total of 168,706 square feet (3.87 acres).

A review of the tax records showed that since 1948 ownership of these parcels has been limited to Grove Farm and its subsidiaries. Based on interviews and *The Story of Kōloa: A Kauai Plantation Town* by Donal Donohugh, the subject property has been part of a sugar mill from 1913 until 1996, when the mill closed and portions of the property were leased to other companies (Donohugh, 2001).

Table 3 summarizes the information available regarding the historical use and users of the subject property Portion A. Table 4 summarizes the information available regarding the historical use and users of the subject property on Portion B.

Table 3. Users and Primary Uses of Subject Property Portion A

Period (approx.)	Owner / Property User	Primary Use
2007-present	Visionary, L.L.C./Jade Construction and Wa'alani Enterprises	Roof truss construction shop, construction company equipment and materials baseyard
2006-2007	Visionary, L.L.C./unoccupied	Vacant
1996-2006	Grove Farm Company, Inc./unoccupied	Vacant
1974-1996	Grove Farm Company, Inc./McBride Sugar Company, Ltd.	Sugar mill (bagasse house and fire suppression system)
1948-1974	Grove Farm Company, Inc./Grove Farm Company, Inc.	Sugar mill
1913-1948	Kōloa Plantation/Kōloa Plantation	Sugar mill
1835-1913	Undocumented but owner and user likely Ladd & Company followed by Dr. Robert W. Wood followed by Kōloa Plantation	Sugarcane production

Table 4. Users and Primary Uses of Subject Property Portion B

Period (approx.)	Owner / Property User	Primary Use
2007-present	Grove Farm Company, Inc./Wa'alani Enterprises	Vacant
1996-2006	Grove Farm Company, Inc./unoccupied	Vacant
1974-1996	Grove Farm Company, Inc./McBride Sugar Company, Ltd.	Sugar mill (settling pond)
1948-1974	Grove Farm Company, Inc./Grove Farm Company, Inc.	Sugar mill
1913-1948	Kōloa Plantation/Kōloa Plantation	Sugar mill
1835-1913	Undocumented but owner and user likely Ladd & Company followed by Dr. Robert W. Wood followed by Kōloa Plantation	Sugarcane production

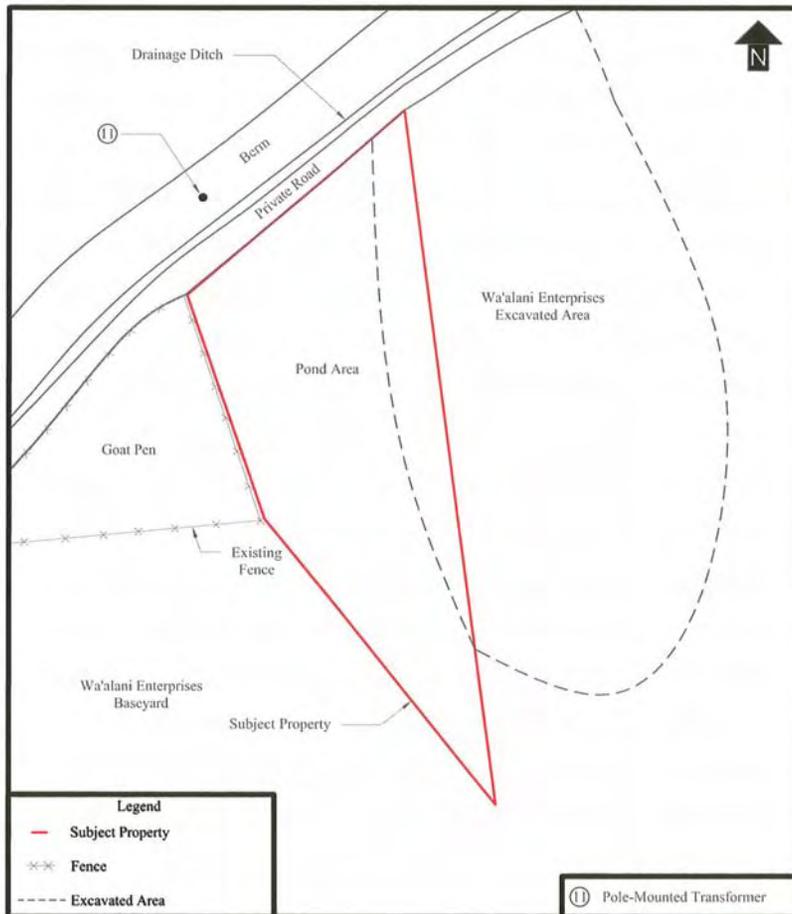


Figure 4. Site Map of Portion B
Phase I Environmental Site Assessment Report
Proposed Poipu Wastewater Treatment Plant
Property at Former Kōloa Mill
Mahaulepu Road, Kōloa, Hawai'i
TMK (4) 2-9-002:001 and TMK (4) 2-9-002:001



3.6 CURRENT AND PAST USES OF ADJOINING PROPERTIES

Because the subject property only occupies a portion of a tax parcel, and because the tax parcels involved are so large, adjoining parcels are unlikely to affect the subject property and thus were not investigated under this assessment. Areas of parcel (4) 2-9-001:001 and (4) 2-9-002:001 adjacent to and surrounding the subject property were assessed for their ability to impact the subject property.

Historical use of the area adjacent to subject property Portion A is the sugar mill and auxiliary buildings. To the south of Portion A is Mahaulepu Road. Across the road were agricultural fields historically used for sugarcane production. More recently these fields may have been used by Pioneer Seed for corn seed production. The area to the east has served as a baseyard for Wa'alani Enterprise since 1999. The sugar mill has been vacant since it closed in 1996. The area west of the mill contains several tenants. However, based on proximity, topography, and site activities this area is not believed to have the potential to impact the subject property. To the north of subject property Portion A is sugar mill ancillary facilities and open space. Beyond that is an area used by Trashco as a baseyard for refuse containers. Based on proximity, topography, and site activities this area is not believed to have the potential to impact the subject property.

The area adjacent to subject property Portion B were historically used for sugarcane production. The area east of Portion B is currently used by Wa'alani Enterprises and has been excavated and used for off-site fill material.

4.0 USER PROVIDED INFORMATION

User provided information was obtained by having the user fill out a "User Questionnaire" administered by MNA. The following information was obtained from the questionnaire.

4.1 ENVIRONMENTAL LIENS OF ACTIVITY AND USE LIMITATIONS

HOH Utilities is not aware of any environmental liens for the subject property.

4.2 SPECIALIZED KNOWLEDGE

HOH Utilities does not have any specialized knowledge related to the subject or nearby properties.

4.3 VALUATION REDUCTION

The subject property is not being sold but is being leased by HOH Utilities. The lease price will be based on fair market value for the property. This has not yet been established. No value reduction has been established as of this report.

4.4 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

The subject property was a former sugar mill.

4.5 REASON FOR PERFORMING THE PHASE I ESA

HOH Utilities plans to lease a portion of the sugar mill property for construction and operation of a wastewater treatment plant. An Environmental Impact Statement is being prepared and the Phase I ESA is part of the Environmental Impact Statement.

4.6 OTHER

The user provided no other information regarding the subject property.

5.0 RECORDS REVIEW

Under ASTM 1527-05, records are to be reviewed by the environmental professional that may help identify RECs in connection with the subject property.

5.1 STANDARD ENVIRONMENTAL RECORD SOURCES

MNA used TIS to search standard federal and state government databases for hazardous substance or petroleum product releases that could impact the subject property. A copy of the report is provided in Appendix A.

ASTM E 1527-05 specifies a minimum search distance for specific environmental record sources. The following sources are specified for incidents or sites within one mile of the subject property:

- Federal NPL site list
- Federal RCRA CORRACTS TSD facilities list
- State hazardous waste sites

The following sources are specified for incidents or sites within one-half mile of the subject property:

- Federal Delisted NPL site list
- Federal CERCLIS list
- Federal CERCLIS NFRAP site list
- Federal RCRA non-CORRACTS TSD facilities list
- State Brownfield Sites
- State landfill and/or solid waste disposal site list
- State leaking UST list
- State Voluntary Cleanup sites

The following sources are for incidents on the subject and adjoining properties:

- Federal RCRA generators list
- State registered UST list

Finally, the following are for incidents for the subject property:

- Federal ERNS list
- Federal Institutional and Engineering Controls Registries
- State Institutional and Engineering Controls and Registries
- State SPILLS list

5.1.1 Federal National Priorities List

The NPL, maintained by the United States Environmental Protection Agency (USEPA), is a list of the worst hazardous waste sites that have been identified by Superfund. TIS identified no NPL sites within one mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.2 Federal RCRA CORRACTS TSD Facilities List

The RCRA CORRACTS TSD facilities list is maintained by the USEPA. This list contains generators, transporters, treaters, storers, and disposers of hazardous waste that have reported violations and are subject to corrective actions. TIS identified no facilities within one mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.3 State Sites of Interest

HDOH Office of Hazard Evaluation and Emergency Response (HEER Office) maintains a list of facilities, sites, or areas in which the HEER Office has an interest, or has or may investigate. This list includes CERCLIS sites. TIS identified no state sites within one mile of the subject property (TRACK Info Services, L.L.C., 2009). However a manual review of the state database in conjunction with a review of the state SPILL database identified that the sugar mill property is listed as a property of environmental interest. Based on the database this stems from a release of oil in August 1994. This release is discussed in Section 5.2 of this report.

5.1.4 Delisted NPL Site List

The Delisted NPL Site List, maintained by the USEPA, contains delisted NPL sites. TIS identified no delisted NPL sites within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.5 Federal CERCLIS List

The CERCLIS list, maintained by the USEPA, contains sites that are either proposed to be or are on the NPL list as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. TIS identified no CERCLIS mapped sites listed within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.6 Federal CERCLIS NFRAP Site List

The CERCLIS NFRAP list, maintained by the USEPA, contains designated CERCLA sites that, to the best of USEPA's knowledge, assessment has been completed and has determined no further steps will be taken to list the sites on the NPL. TIS identified no CERCLIS NFRAP mapped sites listed within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.7 Federal RCRA non-CORRACTS TSD facilities list

The RCRA non-CORRACTS TSD facilities list, maintained by the USEPA, contains RCRA permitted facilities that treat, store, or dispose of hazardous waste. TIS identified no RCRA TSD facilities listed within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.8 State Brownfield Sites

State Brownfield Sites, maintained by the HDOH HEER office, is an inventory of state designated Brownfield sites. TIS identified no State Brownfield sites within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.9 State Landfill/Solid Waste Disposal Sites

HDOH records contain an inventory of permitted landfills in the State of Hawai'i. TIS identified no permitted solid waste landfills, incinerators, or transfer stations within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.10 State LUST List

The State LUST list, maintained by the HDOH Solid and Hazardous Waste Branch (SHWB), maintains an inventory of sites with LUSTs. TIS identified no LUST facilities within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.11 State Voluntary Cleanup Sites

The State Voluntary Cleanup sites list, maintained by the HDOH HEER Office, contains sites participating in the state's Voluntary Response Program. TIS identified no sites participating in the State Voluntary Response Program within ½ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.12 Federal RCRA Generators List

The RCRA Generators list, maintained by the USEPA, contains small and large quantity generators of RCRA hazardous waste. The determination of generator size is used to establish the risk that the facility poses to public health and the environment and consequently, the amount of regulation and reporting required. Large Quantity Generators (LQG) are facilities that generate more than a 1,000 kilograms per month of hazardous waste and/or more than 1 kilograms per month of acute hazardous waste. Small Quantity Generators (SQG) are facilities that generate less than 1,000 kilograms per month but more than 100 kilograms per month of hazardous waste and/or less than 1 kilogram per month of acute hazardous waste. Conditionally Exempt Small Quantity Generators (CESQG) are facilities that generate less than 100 kg/month of hazardous waste and/or less than 1 kilogram per month of acute hazardous waste. The EPA also maintains the RCRA No Longer Regulated (NLR) list. This list contains facilities that were once on the RCRA generators list but are no longer in business, no longer in business at the listed address, or are no longer generating hazardous waste materials in quantities that require reporting. TIS identified no RCRA generators or NLR generators within ¼ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.13 Federal Institutional Controls (ICs) and Engineering Controls (ECs) Registries

Federal ICs and ECs are Superfund sites that have either an IC or EC. TIS identified no Federal ICs or ECs within ¼ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.14 State ICs and ECs Registries

The State of Hawai'i maintains a list of properties that have been remediated to a particular standard. Because the sites may continue to be impacted by past use, future use of the property may be restricted in order to protect human health and the environment. Land Use Controls can be either ICs or ECs. Institutional controls are limitations on how the property may be used such as limiting use to industrial activities. Engineering controls are physical structures or devices located on the property that contain or limit exposure to contamination. Engineering controls need to be maintained or protected to be effective. TIS identified no state ICs or ECs sites within ¼ mile of the subject property listed in this database (TRACK Info Services, L.L.C., 2009).

5.1.15 State Registered UST List

The HDOH SHWB maintains a database of known underground storage tanks. TIS identified no UST facilities within ¼ mile of the subject property (TRACK Info Services, L.L.C., 2009).

5.1.16 Federal ERNS List

The ERNS list, maintained by the USEPA, contains CERCLA hazardous substance releases or spills, as maintained at the National Response Center. TIS identified no incidents on the subject property (TRACK Info Services, L.L.C., 2009).

5.1.17 State SPILL List

HDOH HEER Office maintains a database of known releases to the environment of hazardous material or petroleum products. TIS identified no spill incidents on the subject property (TRACK Info Services, L.L.C., 2009). However, a review of the HDOH HEER Office case files identified a release that is listed in the database but was not identified. This release is discussed in Section 5.2 of this report.

5.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES

MNA reviews additional environmental record sources as needed. In regards to the subject property, MNA requested a review of HDOH HEER Office and SHWB case files for the subject property.

During the review of HDOH HEER Office case files MNA obtained and reviewed a Notification Report for a release of a reportable quantity of oil that occurred on August 20, 1994. The report, and associated SPILL database record, contain limited information. What is stated is that five gallons of oil were released to a building interior as the result of an overflow while filling a piece of equipment. The oil flowed from the floor to some type of water and eventually dissipated. It is not clear what water source is being referred to in the report. No cleanup, release response, or subsequent investigation appears to have occurred. The HDOH HEER Office Emergency Preparedness and Response Section's State On-Scene Coordinator issued a No Further Action Status for the release indicating that no additional time sensitive action needed to be taken.

MNA reviewed records provided by the HDOH SHWB. Records indicated that McBride operated a maintenance shop at the Kōloa mill facility. No citations or regulatory action was taken against McBride based on activities at the maintenance shop. However, there was concern over releases from the shop, which were known to run from the shop into the adjacent sugarcane field. Additionally, HDOH SHWB had concerns over McBride management of chemicals associated with boiler use and maintenance.

MNA requested information from the Kaua'i Fire Department (KFD). KFD reported no fires, fire code violations, or aboveground or underground storage tank removals or installations. However, KFD also indicated that County records may be incomplete due to a loss of records in 1992.

MNA made several requests over several months to the Kaua'i Island Utility Cooperative (KIUC) for information regarding environmental issues at the subject property. As of this report MNA has received no information from KIUC. Should KIUC provide

information regarding the subject property MNA will review it and provide a supplemental statement, as needed.

In October 2000, Clayton Group Services prepared a Phase I ESA for the entire Grove Farm holding in southeast Kaua'i (Clayton Group Services, Inc., 2000). This area covers 22,000 acres and covers a wide variety of facilities, land uses, and levels of property development. As the report refers to the entire 22,000 acres as the subject property the level of detail provided for each area is limited. This report was made available by Grove Farm and MNA reviewed the sections of the report pertinent to the subject property. These sections refer to the pertinent land areas as former Kōloa sugar mill, former Kōloa herbicide plant, and Kōloa mud pond area. Based on the information provided in the 2000 report, landforms surrounding the mill appear to be significantly different from those observed during site reconnaissance visits conducted for this Phase I ESA. Discussions of the sugar mill appear to cover the area from the bagasse house west to the junction of Mahaulepu Road and Weliwili Road. Discussions of the herbicide mixing area are identified as covering the area directly east of the mill, including the areas occupied by Trashco and Wa'alani Enterprises, and refers to a concrete-paved herbicide mixing area and seed heat-treatment building. Discussions of the mud pond area refer to the area ½-mile east of the sugar mill, and the discharge for the sugar mill drainage ditch.

With respect to the former sugar mill, herbicide plant, and mud pond area, the 2000 Phase I ESA identified nine, three, and no RECs; none, none, and one potential recognized environmental condition; and none, two, and one significant finding, respectively. Identified RECs, potential recognized environmental condition, and significant findings included the following.

Sugar mill

- REC: Kaua'i Electric Company substation northwest of the mill
- REC: transformers and electrical equipment in and around the mill
- REC: former USTs at fueling station northeast of the mill
- REC: drums and aboveground storage tank (AST) in the fueling station building
- REC: oil release area in mill power plant
- REC: 10 petroleum storage ASTs in and around the mill
- REC: nine drums of petroleum and hazardous materials in the mill
- REC: multiple hazardous material ASTs throughout mill
- REC: subsurface vaults beneath welding and machine shop north of the mill

Herbicide plant

- REC: potential for past release
- REC: random staining as well as petroleum and other liquid drums and ASTs
- Finding: 1,000-gallon AST and three 55-gallon oil drums
- Finding: Seed treatment building not accessible during inspection
- REC: light colored staining of soil in concrete-lined drainage trench

Mud pond area

- Potential recognized environmental condition: petroleum and chemical releases into drainage trench
- Finding: abandoned 1,000-gallon AST near southwest corner of area

In June 2009, MNA prepared an assessment of surface (0" to 2") and subsurface soil (18" to 24", with one sample at 4.5') in a portion of the washwater settling pond. The assessment looked at the concentration of organochlorine pesticides, chlorinated herbicides, polychlorinated biphenyls (PCBs), arsenic, automotive metals (cadmium, chromium, lead, nickel, and zinc), diesel range hydrocarbons, and motor oil range hydrocarbons in an area of the pond directly adjacent to subject property Portion B. The assessment found that the concentration of all analytes in surface and subsurface soil was either below the analytical reporting limit (non-detect) or below HDOH HEER Office 2009 action levels, with the exception of chromium that exceeded the action level by 25%. The assessment concluded that this exceedance could be the results of the background concentration of this metal as opposed to an anthropogenic release to the environment (Mycunghee Noh & Associates, L.L.C., 2009).

5.3 HISTORICAL USE INFORMATION ON THE SUBJECT SITE

Historical use information reviewed for the subject property included aerial photographs and United States Geological Survey (USGS) topographic maps. Fire insurance maps were unavailable for the subject property and surrounding area.

5.3.1 Aerial Photographs

Aerial photographs of the subject and adjoining properties were reviewed at the R.M. Towill Corporation in Honolulu. Photographs from the years 1960, 1962, 1972, 1974, 1992, 1993, and 1995 were reviewed (R.M. Towill Corporation, 2009). The photographs depicted the following.

1960: Kōloa mill was visible and in use. Residences were present adjacent to the mill to the northeast. Kaiuahu and Muhole roads were visible. The scrap shed and bagasse house are not present. An area that appears to be bare soil is visible to the east of the mill in the area reported to be the washwater settling pond.

1962: No changes from the 1960 photograph were visible.

1972: A road runs north and east of the mill intersecting with Mahaulepu Road between the mill and the scrap shed, which is visible. The mill is smaller and not yet in its modern configuration. The area east of the scrap shed is being utilized but does not appear to be a pond. It appears to contain vehicles and structures.

1974: No changes from the 1972 photograph were visible. The pond area does not appear to be used as a pond.

1992: The mill building and all ancillary buildings appear in the current configuration and size. This includes the bagasse house and scrap shed. The area east of the scrap shed is in a different configuration but again does not appear to be a pond. It contains structures and vehicles and appears to be a dirt area with various islands of vegetation.

1993: No changes from the 1992 photograph were visible.

1995: No changes from the 1992 photograph were visible.

5.3.2 Historical Topographic Maps

USGS topographic maps that cover the subject property and vicinity were reviewed. Maps were available for the years 1912, 1963, and 1983 (TRACK Info Services, L.L.C., 2009). The maps depicted the following:

1912: The town of Kōloa is visible to the west of the subject property. The mill and many of the roads adjacent to the mill site are absent. Railroad tracks run both north/south and east/west crossing to the southeast of the subject property. This suggests that the area is in sugarcane production with cane being transported by railcar to another mill.

1963: The mill facility appears in a more historical configuration. The mill house and buildings to the north are smaller and have shapes different from the current geometry. The bagasse house, fire suppression water tank, and shed are all absent. To the north and northeast of the mill facility are smaller buildings that appear to be arranged as residences.

1983: Most of the current mill infrastructure and surrounding roads area visible on the topographic map. The bagasse house and fire suppression water tank on the subject property are visible. The large shed to the east is also visible. To the north and northeast of the mill facility are smaller buildings that appear to be arranged as residences.

5.3.3 Fire Insurance Maps

Fire insurance map coverage was unavailable for the project area.

6.0 SITE RECONNAISSANCE

The site reconnaissance was conducted on March 3, April 20, and May 26, 2009, by Jennah Oshiro and Evan Pfaff of MNA. The site visits focused on identifying *recognized environmental conditions* at the subject property and surrounding areas with the potential to impact the subject property.

6.1 METHODOLOGY AND LIMITING CONDITIONS

The site reconnaissance was conducted by visually inspecting all readily accessible areas of the subject property including the interior and exterior of structures. The area was walked in an organized pattern such that all areas could be observed. Photographs from the site reconnaissance are presented in Appendix B.

Portions of the sugar mill were inspected. Inspection of this area was limited by visibility and safety considerations. Only the first floor area was inspected. Upper levels of the mill were not inspected. Overgrown vegetation occurred throughout the subject property and surrounding area. This was especially true in Portion B of the subject property. This limited the ability to observe the subject property and surrounding area.

6.2 GENERAL SITE SETTING

The subject property consists of two non-contiguous portions of property located at the former Kōloa mill. The mill is vacant but various ancillary buildings and land surrounding the mill has been leased to a variety of companies since the mill closed in 1996. Area surrounding the mill was agricultural fields formerly used for sugarcane production but that are now mostly fallow.

Photographs of general site setting and adjacent properties are included in Appendix B photographs 1 through 3.

6.3 HAZARDOUS SUBSTANCES AND PETROLEUM PRODUCTS

Hazardous substances and petroleum products were found on the subject property and surrounding area during the site reconnaissance visits. Ten areas in and around subject property Portion A were identified as containing hazardous materials or petroleum products. One area near subject property Portion B was identified as containing hazardous materials or petroleum products. Figure 3 and Figure 4 identify these areas.

Subject Property Portion A

Area 1: A variety of containers containing fuel and lubricants used by Jade Construction were observed inside the bagasse house. Outside the bagasse house on the west wall was a portable generator that likely contains fuel and lubricants. It appeared that this generator was brought onsite by Jade Construction to supply power for their operations.

Area 2: To the east of the bagasse house were approximately ten large motors that may contain PCBs. Also in this area were two automotive batteries in poor condition.

Area 3: Further to the east across a chain link fence is an area used by Wa'alani Construction. On this area several vehicles and pieces of earth moving equipment were observed. Many of the vehicles and equipment were leaking petroleum products. Soil staining was observed in many areas. Additionally this area contained over 30 drums of petroleum products and non-chlorinated solvents.

Area 4: To the southeast of the bagasse house across a chain link fence is an area used by Wa'alani Construction. This area contained four portable aboveground storage tanks and six vehicle batteries. The contents of the ASTs could not be determined. The batteries were in poor condition.

Area 5: Southwest of the bagasse house, associated with the fire suppression pump house, was an approximately 150-gallon AST that likely contained diesel fuel. The quantity of fuel in the AST could not be determined. At a minimum it likely contains diesel fuel residual. The pump house contains a diesel powered generator and control system. The generator likely contains fuel, lubricants, and coolant. Additionally several large batteries for starting the generator were also present. Outside the pump house were a boat and vehicle. The boat appeared to be stored on site while the vehicle appeared to be abandoned. The boat and vehicle likely contain fuel, lubricants, coolant, and batteries.

Area 6: Northeast of the bagasse house is the former mill bunker fuel AST farm. The area contains five approximately 1,000-gallon ASTs. The ASTs were observed to be between 25 and 40 percent full of petroleum product. No ground staining or leaks were observed. Access to the area was somewhat limited by vegetation in the area, the close proximity of the tanks to each other, and the retaining wall on either side of the tank farm.

Area Adjacent to Subject Property Portion A

Area 7: To the east of the subject property is an unimproved area utilized by Wa'alani Enterprises to store, equipment, materials, and wastes. During the site visit of March 3, 2009, MNA observed over 100 used automotive batteries, many in poor condition. Approximately 15 drums of petroleum lubricants were stored on a drum rack at the south end of the area. A portable AST and other equipment containing petroleum products were observed in this area. Soil staining was observed throughout the area as well as beneath the drum rack. During the site visit of April 20, 2009, this area had been cleared. Larger pieces of equipment had been moved to other areas of the site. The drum rack and batteries were not observed on the site. Soil in the area appeared to have been recently disturbed and graded.

Area 8: To the north of the subject property is a relatively open area bounded by the mill to west, transformer cage to the north, and chain link fence to the east. At the north end of this area MNA observed a 55-gallon drum full of unknown contents. The lid of the drum was covered with oil suggesting that the drum contents was a petroleum product. Also in this area was a large suspect PCB-containing capacitor. This area also contained a rusted out drum and AST that may have contained hazardous materials or petroleum products.

Area 9: North of the subject property is also a transformer cage containing three large transformers. These transformers likely contain some type of oil and may also contain PCBs.

Area 10: To the west of the subject property is the sugar mill. Electrical equipment, ASTs, and motors were observed in the areas of the mill observed during the site visits. A petroleum leak from an unknown location was observed in the mill. The mill contains some quantity of petroleum products and likely hazardous materials.

Subject Property Portion B

Subject property Portion B is predominantly covered by tall guinea grass making direct observation of materials in the area difficult. During the site visits MNA observed Portion B from several perimeter points. Additionally the area was observed from the top of the berm on the west edge of the area. No hazardous materials or petroleum products were observed.

Area Adjacent to Subject Property Portion B

Area 11: To the north of subject property Portion B is a pole mounted electrical transformer in poor condition. The transformer likely contains oil and may also contain PCBs.

Photographs of identified hazardous materials and petroleum products are presented in Appendix B, Photographs 4 through 25.

6.4 UNDERGROUND STORAGE TANKS

MNA observed no evidence of USTs on the subject property or surrounding areas.

6.5 EXTERIOR OBSERVATIONS

The subject property consists of Portion A and Portion B. Portion A consist of 86,325 square feet and contains the former bagasse house, a 12 by 12 foot pump house, approximately 250-gallon aboveground storage tank for diesel, approximately 100,000-gallon water tank, six aboveground storage tanks of various sizes for bunker fuel, and 250 feet of unpaved driveway with locking gate. A chain link fence running from Mahaulepu Road north beyond the mill bisects the subject property to the east of the bagasse house. The area is accessed from Mahaulepu Road, which is a private road, via Kōloa Bypass Road. Potential findings related to exterior observations are discussed in Section 6.3 of this report.

Portion B consist of 82,381 square feet of the former mill washwater settling pond. It was accessed from Mahaulepu Road, which is a private road, via Kōloa Bypass Road. The unpaved driveway is accessed by a locked gate and is the same driveway as that used by Wa'alani Enterprises. An unpaved private road leads from the baseyard to Portion B. Portion B is predominantly covered by tall guinea grass making direct observation of materials in the area difficult. During the site visits MNA observed Portion B from several perimeter points. Additionally the area was observed from the top of the berm on the west edge of the area. No distressed vegetation, improvements, or material containers were observed.

Photographs of exterior observations are presented in Appendix B, Photographs 26 and 27.

6.6 INTERIOR OBSERVATIONS

The interior of the bagasse house and pump house were observed by walking the inside the buildings. The bagasse house contained equipment and supplies for, and wastes from the manufacture of roof trusses. A conveyer system in the interior of the building extends along the roof of the bagasse house. This system also extends beneath the floor of the bagasse house. This part of the system was not observed. The mill washwater drainage trench runs beneath the floor of the bagasse house. The pump house contained an engine, pump, and control system for a fire suppression system. No structures were present on subject property Portion B and thus no interior observations were made. Photographs of interior observations are presented in Appendix B, Photograph 28.

7.0 INTERVIEWS

MNA conducted three interviews as part of this assessment. MNA interviewed two former employees of the sugar mill, Earl Smith and Adam Killerman. MNA also interviewed a current tenant of the subject and adjacent property, Ricky Wa'alani, owner of Wa'alani Enterprises.

7.1 FORMER EMPLOYEES

MNA conducted an interview with Earl Smith at the subject property on March 3, 2009. Mr. Smith worked at the Kōloa mill from 1974 until 1978. During that time he served as Superintendent of Factory and Shops and also as the Department Head for Planning and Development. Mr. Smith provided information on the operations of a sugar mill as well as information on the development of mill infrastructure. The roundhouse to the south of the mill as well as the adjacent water tank were installed in 1976. The roundhouse was planned as a sugar storage facility to deal with the inability to ship sugar due to a strike. The shed to the east of the bagasse house was used as a junkyard. Scrap metal and debris was accumulated in this area during mill operations and was sold as scrap once or twice a year. The mill was operated by McBride from 1974 to 1996 under a 22-½ year lease from Grove Farm. The AST farm north of the subject property stored bunker fuel to fire the mill boiler when there was insufficient bagasse. The use of bunker fuel was very restricted and an employee would have been in trouble for spilling it. Mr. Smith was not aware of any major spills or releases of petroleum products or hazardous materials. No insecticides were used in the sugarcane field but herbicides were. Aqueous ammonia was used as fertilizer in the cane fields. Mr. Smith was not aware of the storage or handling areas for these chemicals.

MNA conducted an interview with Adam Killerman at the subject property on April 20, 2009. Mr. Killerman worked at the Kōloa mill from 1979 until the mill closed in 1996. During that time he served as Irrigation Superintendent. Mr. Killerman continues to maintain and operate the irrigation infrastructure for the surrounding agricultural lands.

Mr. Killerman was able to provide information on the flow of wash and irrigation water through the mill and fields. Grove Farm stopped operation of the mill in 1974 and leased the property to McBride. Washwater from the washing of sugarcane flowed through the drainage ditch to the settling pond. The settling pond covered 10-acres. Following settling, water was removed from the pond and flowed via canals to the sugarcane field where it was used for irrigation. Agricultural chemicals were not added to the irrigation water for distribution into the fields but were spread by other means. Mr. Killerman does not believe that petroleum products or hazardous materials were discharged to the drainage ditch. Agricultural chemicals such as pesticides, insecticides, and fertilizers, were in general not stored or mixed on the mill site but were stored and prepared at an off-site facility and then transported to the fields for applications. There was a fertilizer mixing area northwest of the mill. There were USTs to the northwest of the mill but they were removed. Mr. Killerman also indicated that bunker fuel had to be abandoned as a fuel source for the boiler because there came a time when nobody wanted to deliver it due to environmental regulations. The building northeast of the scrap shed was a heat treatment facility for improving the germination of sugarcane seed. Next to this building used to be a building for a seed fungicide treatment process but this building is no longer present.

7.2 CURRENT TENANT

MNA conducted an interview with Ricky Wa'alani at the subject property on March 3, 2009. Mr. Wa'alani is the owner and operator of Wa'alani Enterprises, which has leased the area east of the bagasse house, north of Mahaulepu Road, south of the drainage trench, and west to the second major pond berm since January 1999. Wa'alani Enterprises is a construction and trucking company that specializes in earth moving activities. The leased area at the mill site serves as repair, maintenance, and storage baseyard for company activities. Mr. Wa'alani indicated that a variety of automotive petroleum products were present at the subject property during mill operation and are currently present on his leased portion of the property. He is not aware of any spills or releases of petroleum products or hazardous materials. Mr. Wa'alani believes that all of the mill USTs were removed and he does not operate any USTs.

8.0 DATA GAPS

As defined by the ASTM E 1527-05 standard for conducting Phase I ESAs the only data gap that exist for this Phase I ESA is the inability to interview the key site manager of the mill for the period prior to 1974. However, there are several areas where additional data would be desirable. It is likely that this data is either not available or is not readily available and thus is outside the scope of a Phase I ESA. Nonetheless, the lack of information in these areas presents a limitation in knowledge regarding the environmental condition of the subject property. Several of the areas where limited information exists include the following.

- Limited visibility of subject property Portion B
- Limited information on the management of hazardous materials and petroleum products during the shutdown of the mill in 1996
- Limited information on the size, age, and management of the AST farm that stored bunker fuel for the mill boiler
- Limited information on the storage, mixing, and management of agricultural chemicals at the mill
- Limited information on the presence and closure of USTs at the mill
- Limited information on the power plant and electrical system of the mill, and the associated knowledge related to the presence of PCBs at the facility

9.0 SUMMARY OF FINDINGS

The principle source of information for this assessment of the environmental condition of the subject property was site reconnaissance visits. Only two environmental records were available and they contained little information. The interviews conducted did provide information about the history of the mill and its operation but little detail about environmental management. Additionally, the interviews were not able to provide information on a significant operating period of the mill.

Section 6.3 of this report provides detailed information on the observations made during the site reconnaissance visits. As follows is a summary of the findings from the site reconnaissance visits.

Subject Property Portion A

- Area 1: Fuel and lubricants in use by Jade Construction at the bagasse house.
- Area 2: Discarded automotive batteries and electrical motors
- Area 3: Storage and release of hazardous materials and petroleum products
- Area 4: ASTs, batteries
- Area 5: Petroleum AST, diesel powered engine and generator, and automotive batteries
- Area 6: AST farm

Area Adjacent to Subject Property Portion A

- Area 7: Batteries, ASTs, storage and release of petroleum products
- Area 8: AST, drum of petroleum product, suspect capacitor
- Area 9: Transformers
- Area 10: Possible PCB containing electrical equipment, ASTs of petroleum products and possibly hazardous materials, release of petroleum products

Subject Property Portion B

Subject property Portion B contains sediment from the surrounding agricultural fields that were washed from harvested cane and conveyed into the pond in a drainage trench that ran through the mill. Agricultural chemical residues bound to soil would be present in pond soil. Additionally, any petroleum products intentionally or accidentally discharged to the drainage trench would be deposited in the pond area. Sampling of settling pond

sediment in an area adjacent to the subject property did find pesticide residues as well as petroleum hydrocarbons in the soil. The concentration of these chemicals was below the HDOH HEER Office 2009 action levels.

Area Adjacent to Subject Property Portion B

Area 11: Possible PCB-containing transformer in poor condition

Other Findings

One of the environment records indicated that a five gallon release of oil occurred in the mill in 1994. No subsequent action was ever taken. The other record indicates that HDOH SHWB was concerned over discharges from the maintenance shop that were running into the adjacent sugarcane field. There was also concern over the management of boiler maintenance chemicals. No citation or regulatory action was taken. The Clayton 2000 Phase I shows a welding and machine shop located to the north of the mill. MNA believes, but can not document, that during the interview with Mr. Earl Smith, he indicated that a maintenance shop was located in Area 4 of the subject property. Based on the layout and topography of the facility it seems unlikely that a shop north of the mill would generate a discharge that would flow into a sugarcane field. Alternatively, a shop in Area 4 could easily create a discharge that would run across Mahaulepu Road into a sugarcane field.

Aerial photographs consistently showed the area east of the scrap shed to be part of the mill facility but not in a way that reflected the anticipated use as a washwater settling pond. Reservoirs north and south of the mill were visible in most photographs giving a comparison point for bodies of shallow standing water. Structures and what appeared to be vehicles were present in the pond area further contributing to idea that this area was no part of a settling pond. Interviewees described the pond as containing only a 24 hour storage capacity. As a result, it is possible that the pond was frequently drained of water, which was applied daily to sugarcane fields as irrigation water. However, it seems unlikely that none of the photos inspected would show a body of standing water in the area reported to be a washwater settling pond.

10.0 OPINION

Hazardous materials and petroleum products have been present on the subject property since the construction of the sugar mill in 1913. Significant evidence from the investigation of other sugar mills in Hawai'i shows that hazardous materials and petroleum products were not managed in a manner that prevented their release to the soil and possibly groundwater of the mill sites and select areas of the surrounding agricultural fields (typically pesticide mixing areas). Information collected on this subject property leads to several areas of concern regarding the presence of recognized environmental conditions.

There is no indication that a release of the hazardous materials and petroleum products located in Area 1 has occurred or that a material threat of release exists. Therefore, this is not a *recognized environmental condition*.

Lead and acid from the batteries located in Area 2 has been released to the environment. Additionally, polychlorinated biphenyls (PCBs) may have been released from the electrical motors discarded in this area. Therefore, this is a *recognized environmental condition*.

Soil staining as well as the active release of petroleum products were observed in Area 3. Additionally, several drums located in this area were in poor condition, creating a material threat of release. Therefore, this is a *recognized environmental condition*.

Lead and acid from the batteries located in Area 4 has been released to the environment. Additionally, petroleum products and hazardous materials from aboveground storage tanks (ASTs) and stored or discarded equipment may have been released to the environment. Therefore, this is a *recognized environmental condition*.

There is no indication that a release of hazardous materials or petroleum products from the fire suppression pump system located in Area 5 has occurred or that a material threat of release exists. Therefore, this is not a *recognized environmental condition*.

There is no indication that a release of hazardous materials and petroleum products from the AST farm located in Area 6 has occurred or that a material threat of release exists. Therefore, this is not a *recognized environmental condition*.

Lead and acid from the batteries located in Area 7 has been released to the environment. Soil staining as well as the active release of petroleum products was also observed in this area. The proximity, topography, and soil type of the area make the migration of pollutants to the subject property a foreseeable possibility. As a result, this is a *recognized environmental condition*.

Petroleum products and possibly PCBs contained in the drum at the northwest corner of Area 8 have been released to the environment as evidenced by the oil on the top of the drum. Additionally, petroleum products and/or hazardous materials may have been released to the environment from a rusted out drum and AST located in this area. The proximity, topography, and soil type of the area make the migration of pollutants to the subject property a foreseeable possibility. As a result, this is a *recognized environmental condition*.

There is no indication that a release of hazardous materials or petroleum products from the transformers located in Area 9 has occurred or that a material threat of release exists. Therefore, this is not a *recognized environmental condition*.

Petroleum products from equipment and ASTs in the mill, Area 10, have been released to the environment. Hazardous materials from this area may also have been released. Therefore, this is a *recognized environmental condition*.

The likely heavy use of recalcitrant agricultural chemicals and the petroleum product management practices typical of Hawai'i sugar mills may have resulted in the release of hazardous materials or petroleum products to the soil of subject property Portion B. The sampling and analysis of settling pond soil in an area adjacent to Portion B has found the concentration of agricultural chemicals and petroleum product to be below the HDOH 2009 action levels. This soil is believed to be representative of soil in subject property Portion B. As a result, this is not a *recognized environmental condition*.

There is a material threat of the release of a petroleum product and possibly PCBs from the pole-mounted transformer adjacent to subject property Portion B. Therefore, this is a *recognized environmental condition*.

The 1994 release of 5-gallons of oil in the mill is not likely to impact the subject property. As a result, this is not a *recognized environmental condition*.

The discharge of automotive wastes, machine fluids and lubricants, or equipment and vehicle wash water on the subject property such that these wastes caused a runoff into an adjacent sugarcane field is likely to have impacted the soil and possibly the groundwater of the subject property. As a result, this is a *recognized environmental condition*.

The discrepancy, in the area of the reported wash water settling pond, between the land use observed in the aerial photographs and that described by two interviewees is of note. Additionally, infrastructure supporting the idea that the area was used as a water receiving body of some kind is still present and visible. If the area was not used as a pond in the way described by interviewees it does not indicate that a release of hazardous materials or petroleum products did occur. Additionally, the MNA soil assessment report did not find contamination in surface and near surface soils in a portion of this area. This provides evidence that a widespread release of contaminants did not occur in this area. As a result, this is not a *recognized environmental condition*.

11.0 CONCLUSION

MNA performed a Phase I ESA in conformance with the scope and limitations of ASTM E 1527-05 of the subject property located at the former Kōloa Sugar Mill, Mahaulepu Road, Kōloa, Island of Kaua'i, Hawai'i. Any exceptions to, or deletions from, this practice are described in Section 2.4. This assessment has revealed evidence of eight *recognized environmental conditions* in connection with the property including:

- The release of lead, acid, and possibly PCBs to the soil in Area 2 of the subject property
- The release of petroleum products to the soil in Area 3 of the subject property
- The release of lead, acid, and possibly petroleum products or hazardous materials to the soil in Area 4 of the subject property
- The release of lead, acid, and petroleum products to the soil in Area 7, adjacent to the subject property

- The release of petroleum products and possibly PCBs to the soil in Area 8, adjacent to the subject property
- The release of petroleum products and possibly hazardous materials to the building and possibly the soil of Area 10, adjacent to the subject property
- The material threat of a release of petroleum product and possibly PCBs from a pole-mounted transformer in Area 11, adjacent to the subject property
- Discharge of fluids from the maintenance shop, believed to have been located in Area 4 of the subject property

REFERENCES

Clayton Group Services, Inc. (2000). *Phase I Environmental Site Assessment, 22,000-Acre Property Kauai, Hawaii*. Kailua, Hawaii: Claton Group Services.

County of Kaua'i. (2009, June 19). *Real Property Assessment and Tax Billing Divisions*. Retrieved June 25, 2009, from Property Search: <http://www.kauaipropertytax.com/Main/Home.aspx>

Donohugh, D. (2001). *The Story of Koloa: A Kauai Plantation Town*. Honolulu: Mutual Publishing.

MacDonald, G. A., Abott, A. T., & Peterson, F. L. (1970). *Volcanoes in the Sea*. Honolulu: University of Hawai'i Press.

Mink, J. K., & Lau, L. S. (1992). *Aquifer Identification and Classification for Kaua'i: Groundwater Protection Strategy for Hawai'i*. Honolulu: Uinversity of Hawaii at Manoa, Water Resources Research Center.

Morgan, J. R. (1996). *Hawai'i, A Unique Geography*. Honolulu: Bess Press.

Myounghee Noh & Associates, L.L.C. (2009). *Poipu WWTP Pond Soil Assessment Report*. Aiea, Hawai'i: Myounghee Noh & Associates, L.L.C.

R.M. Towill Corporation. (2009). *Aerial Photograph Collection*. Honolulu, Hawaii.

TRACK Info Services, L.L.C. (2009). *Environmental FirstSearch Report for Mahaulepu Road*. Montrose: TRACK Info Services, L.L.C.

United States Department of Agriculture. (2008, November 13). *Natrural Resources Conservation Service*. Retrieved June 24, 2009, from Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

United States Geological Survey. (2009, June 4). *Site Number: 215434159263301 - 2-5426-03 Koloa, Kauai, HI*. Retrieved June 24, 2009, from Groundwater Watch: <http://groundwaterwatch.usgs.gov/AWLSites.asp?S=215434159263301>

APPENDIX A
TRACK Info Services Report

TRACK ► INFO SERVICES, LLC
Environmental FirstSearch™ Report

Target Property:

MAHAULEUPU ROAD

KOLOA HI 96756

Job Number: 50723

PREPARED FOR:

Myounghee Noh & Associates, L.L.C

94 Kohola Street

Hilo, Hawaii, 96720

03-02-09



Tel: (866) 664-9981

Fax: (818) 249-4227

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**Environmental FirstSearch
Search Summary Report**

Target Site: MAHAULEUPU ROAD
KOLOA HI 96756

FirstSearch Summary

Database	Sel	Updated	Radius	Site	1/8	1/4	1/2	1/2>	ZIP	TOTALS
NPL	Y	01-12-09	1.00	0	0	0	0	0	0	0
NPL Delisted	Y	01-12-09	0.50	0	0	0	0	-	0	0
CERCLIS	Y	01-09-09	0.50	0	0	0	0	-	0	0
NFRAP	Y	01-09-09	0.50	0	0	0	0	-	0	0
RCRA COR ACT	Y	11-13-08	1.00	0	0	0	0	0	0	0
RCRA TSD	Y	11-13-08	0.50	0	0	0	0	-	0	0
RCRA GEN	Y	11-13-08	0.25	0	0	0	-	-	0	0
RCRA NLR	Y	09-08-08	0.12	0	0	-	-	-	0	0
Federal IC / EC	Y	12-16-08	0.25	0	0	0	-	-	0	0
ERNS	Y	11-17-08	0.12	0	0	-	-	-	0	0
State/Tribal Sites	Y	07-24-08	1.00	0	0	0	0	0	0	0
State Spills 90	Y	04-04-08	0.12	0	0	-	-	-	0	0
State/Tribal SWL	Y	01-09-09	0.50	0	0	0	0	-	0	0
State/Tribal LUST	Y	07-28-06	0.50	0	0	0	0	-	0	0
State/Tribal UST/AST	Y	08-04-06	0.25	0	0	0	-	-	0	0
State/Tribal EC	Y	NA	0.25	0	0	0	-	-	0	0
State/Tribal IC	Y	07-24-06	0.25	0	0	0	-	-	0	0
State/Tribal VCP	Y	07-24-06	0.50	0	0	0	0	-	0	0
State/Tribal Brownfields	Y	07-24-06	0.50	0	0	0	0	-	0	0
State Other	Y	08-01-08	0.25	0	0	0	-	-	0	0
FI Map Coverage	Y	04-14-06	0.12	0	0	-	-	-	0	0
- TOTALS -				0	0	0	0	0	0	0

Notice of Disclaimer

Due to the limitations, constraints, inaccuracies and incompleteness of government information and computer mapping data currently available to TRACK Info Services, certain conventions have been utilized in preparing the locations of all federal, state and local agency sites residing in TRACK Info Services's databases. All EPA NPL and state landfill sites are depicted by a rectangle approximating their location and size. The boundaries of the rectangles represent the eastern and western most longitudes; the northern and southern most latitudes. As such, the mapped areas may exceed the actual areas and do not represent the actual boundaries of these properties. All other sites are depicted by a point representing their approximate address location and make no attempt to represent the actual areas of the associated property. Actual boundaries and locations of individual properties can be found in the files residing at the agency responsible for such information.

Waiver of Liability

Although TRACK Info Services uses its best efforts to research the actual location of each site, TRACK Info Services does not and can not warrant the accuracy of these sites with regard to exact location and size. All authorized users of TRACK Info Services's services proceeding are signifying an understanding of TRACK Info Services's searching and mapping conventions, and agree to waive any and all liability claims associated with search and map results showing incomplete and or inaccurate site locations.

**Environmental FirstSearch
Site Information Report**

Request Date: 03-02-09
Requestor Name: Jennah Oshiro
Standard: ASTM-05

Search Type: AREA
0.02 sq mile(s)
Job Number: 50723
Filtered Report

Target Site: MAHAULEUPU ROAD
KOLOA HI 96756

Demographics

Sites: 0 **Non-Geocoded:** 0 **Population:** NA
Radon: 0 PCI/L

Site Location

	<u>Degrees (Decimal)</u>	<u>Degrees (Min/Sec)</u>	<u>UTMs</u>
Longitude:	-159.447292	-159:26:50	Easting: 453797.715
Latitude:	21.902962	21:54:11	Northing: 2422011.561
			Zone: 4

Comment

Comment:

Additional Requests/Services

Adjacent ZIP Codes: 0 Mile(s)

Services:

ZIP Code	City Name	ST	Dist/Dir	Sel	Requested?	Date
					Sanborns	No
					Aerial Photographs	No
					Historical Topos	Yes 03-02-09
					City Directories	No
					Title Search/Env Liens	No
					Municipal Reports	No
					Online Topos	No

*Environmental FirstSearch
Sites Summary Report*

Target Property: MAHAULEUPU ROAD **JOB:** 50723
KOLOA HI 96756

TOTAL: 0 **GEOCODED:** 0 **NON GEOCODED:** 0 **SELECTED:** 0

<u>Page No.</u>	<u>ID</u>	<u>DB Type</u>	<u>Site Name/ID/Status</u>	<u>Address</u>	<u>Dist/Dir</u>	<u>Map ID</u>
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*Environmental FirstSearch
Site Detail Report*

Target Property: MAHAULEUPU ROAD **JOB:** 50723
KOLOA HI 96756

No sites were found!

*Environmental FirstSearch
Site Detail Report*

Target Property: MAHAULEUPU ROAD
KOLOA HI 96756

JOB: 50723

No sites were found!

Environmental FirstSearch Descriptions

NPL: EPA NATIONAL PRIORITY LIST - The National Priorities List is a list of the worst hazardous waste sites that have been identified by Superfund. Sites are only put on the list after they have been scored using the Hazard Ranking System (HRS), and have been subjected to public comment. Any site on the NPL is eligible for cleanup using Superfund Trust money.

A Superfund site is any land in the United States that has been contaminated by hazardous waste and identified by the Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment.

FINAL - Currently on the Final NPL

PROPOSED - Proposed for NPL

NPL DELISTED: EPA NATIONAL PRIORITY LIST Subset - Database of delisted NPL sites. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

DELISTED - Deleted from the Final NPL

CERCLIS: EPA COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY INFORMATION SYSTEM (CERCLIS)- CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL.

PART OF NPL- Site is part of NPL site

DELETED - Deleted from the Final NPL

FINAL - Currently on the Final NPL

NOT PROPOSED - Not on the NPL

NOT VALID - Not Valid Site or Incident

PROPOSED - Proposed for NPL

REMOVED - Removed from Proposed NPL

SCAN PLAN - Pre-proposal Site

WITHDRAWN - Withdrawn

NFRAP: EPA COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY INFORMATION SYSTEM ARCHIVED SITES - database of Archive designated CERCLA sites that, to the best of EPA's knowledge, assessment has been completed and has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

NFRAP - No Further Remedial Action Plan

P - Site is part of NPL site

D - Deleted from the Final NPL

F - Currently on the Final NPL

N - Not on the NPL

O - Not Valid Site or Incident

P - Proposed for NPL

R - Removed from Proposed NPL

S - Pre-proposal Site

W - Withdrawn

RCRA COR ACT: EPA RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM SITES - Database of hazardous waste information contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. RCRAInfo facilities that have reported violations and subject to corrective actions.

RCRA TSD: EPA RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM

TREATMENT, STORAGE, and DISPOSAL FACILITIES. - Database of hazardous waste information contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. Facilities that treat, store, dispose, or incinerate hazardous waste.

RCRA GEN: EPA RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM GENERATORS - Database of hazardous waste information contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. Facilities that generate or transport hazardous waste or meet other RCRA requirements.

LGN - Large Quantity Generators

SGN - Small Quantity Generators

VGN - Conditionally Exempt Generator.

Included are RAATS (RCRA Administrative Action Tracking System) and CMEL (Compliance Monitoring & Enforcement List) facilities.

RCRA NLR: EPA RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM SITES - Database of hazardous waste information contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. Facilities not currently classified by the EPA but are still included in the RCRAInfo database. Reasons for non classification:

Failure to report in a timely matter.

No longer in business.

No longer in business at the listed address.

No longer generating hazardous waste materials in quantities which require reporting.

Federal IC / EC: EPA BROWNFIELD MANAGEMENT SYSTEM (BMS) - database designed to assist EPA in collecting, tracking, and updating information, as well as reporting on the major activities and accomplishments of the various Brownfield grant Programs.

FEDERAL ENGINEERING AND INSTITUTIONAL CONTROLS- Superfund sites that have either an engineering or an institutional control. The data includes the control and the media contaminated.

ERNS: EPA/NRC EMERGENCY RESPONSE NOTIFICATION SYSTEM (ERNS) - Database of incidents reported to the National Response Center. These incidents include chemical spills, accidents involving chemicals (such as fires or explosions), oil spills, transportation accidents that involve oil or chemicals, releases of radioactive materials, sightings of oil sheens on bodies of water, terrorist incidents involving chemicals, incidents where illegally dumped chemicals have been found, and drills intended to prepare responders to handle these kinds of incidents. Data since January 2001 has been received from the National Response System database as the EPA no longer maintains this data.

State/Tribal LUST: HI DOH LEAKING UNDERGROUND STORAGE TANKS-The Hawaii Department of Health's inventory of sites with leaking underground storage tanks.

State/Tribal IC: HI DOH INSTITUTIONAL CONTROLS LISTING-The Hawaii Department of Health's Office of Hazard Evaluation and Emergency Response (HEER) inventory of sites with institutional controls.

State/Tribal VCP: HI DOH VOLUNTARY RESPONSE PROGRAM LISTING-The Hawaii Department of Health's Office of Hazard Evaluation and Emergency Response (HEER) inventory of sites participating in the state's Voluntary Response Program.

State/Tribal Sites: HI DOH STATE RESPONSE LISTING-The Hawaii Department of Health's Office of

Hazard Evaluation and Emergency Response (HEER) inventory of facilities, sites, or areas in which HEER has an interest, has investigated, or may investigate under HRS 128D (includes CERCLIS sites).

State/Tribal Brownfields: HI DOH STATE BROWNFIELDS LISTING-The Hawaii Department of Health's Office of Hazard Evaluation and Emergency Response (HEER) inventory of brownfields sites.

State/Tribal UST/AST: HI DOH UNDERGROUND STORAGE TANKS- The Hawaii Department of Health's inventory of underground storage tanks.

RADON: NTIS NATIONAL RADON DATABASE - EPA radon data from 1990-1991 national radon project collected for a variety of zip codes across the United States.

State Other: US DOJ NATIONAL CLANDESTINE LABORATORY REGISTER - Database of addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the U.S. Department of Justice ("the Department"), and the Department has not verified the entry and does not guarantee its accuracy. All sites that are included in this data set will have an id that starts with NCLR.

FI Map Coverage: PROPRIETARY FIRE INSURANCE MAP AVAILABILITY - Database of historical fire insurance map availability.

Environmental FirstSearch
Street Name Report for Streets within .25 Mile(s) of Target Property

Target Property: MAHAULEUPU ROAD
KOLOA HI 96756

JOB: 50723

Street Name	Dist/Dir	Street Name	Dist/Dir
Cane Haul Rd	0.14 NW		
Kaluahonu Rd	0.13 NW		
Mahaulepu Rd	0.01 SE		
Mahoulepu Rd	0.13 NW		



HISTORICAL FIRE INSURANCE MAPS

NO MAPS AVAILABLE

03-02-09
50723
MAHAULEUPU ROAD
KOLOA HI 96756

A search of FirstSearch Technology Corporation's proprietary database of historical fire insurance map availability confirmed that there are NO MAPS AVAILABLE for the Subject Location as shown above.

FirstSearch Technology Corporation's proprietary database of historical fire insurance map availability represents abstracted information from the Sanborn® Map Company obtained through online access to the U.S. Library of Congress via local libraries.

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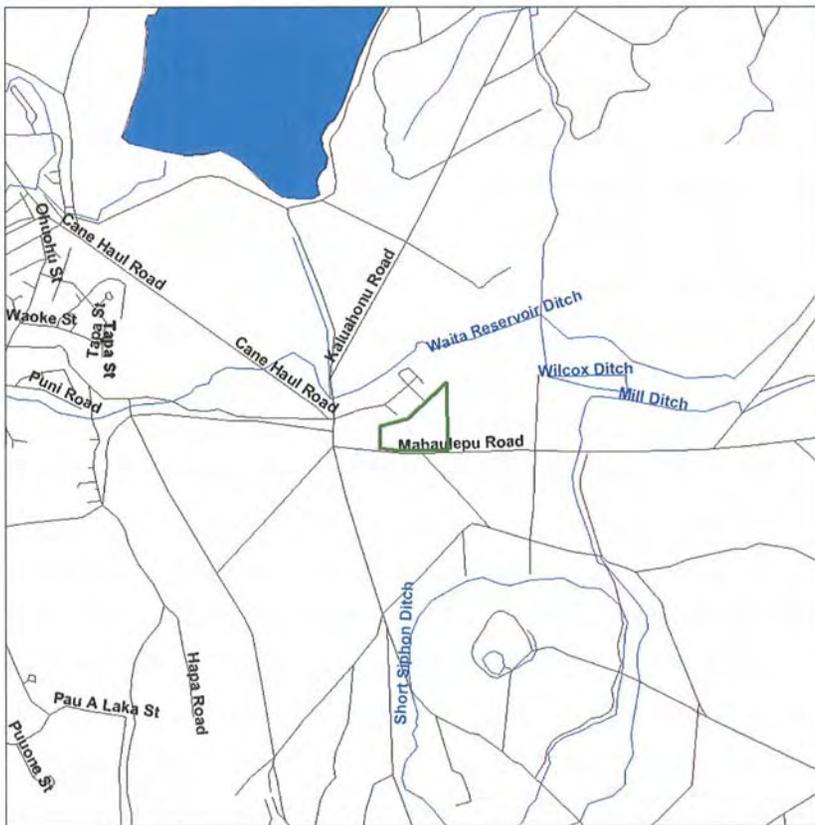


Environmental FirstSearch

1 Mile Radius from Area
Single Map:



MAHAULEUPU ROAD, KOLOA HI 96756



Source: U.S. Census TIGER Files

- Area Polygon
- Identified Site, Multiple Sites, Receptor
- NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste
- Triballand
- Railroads

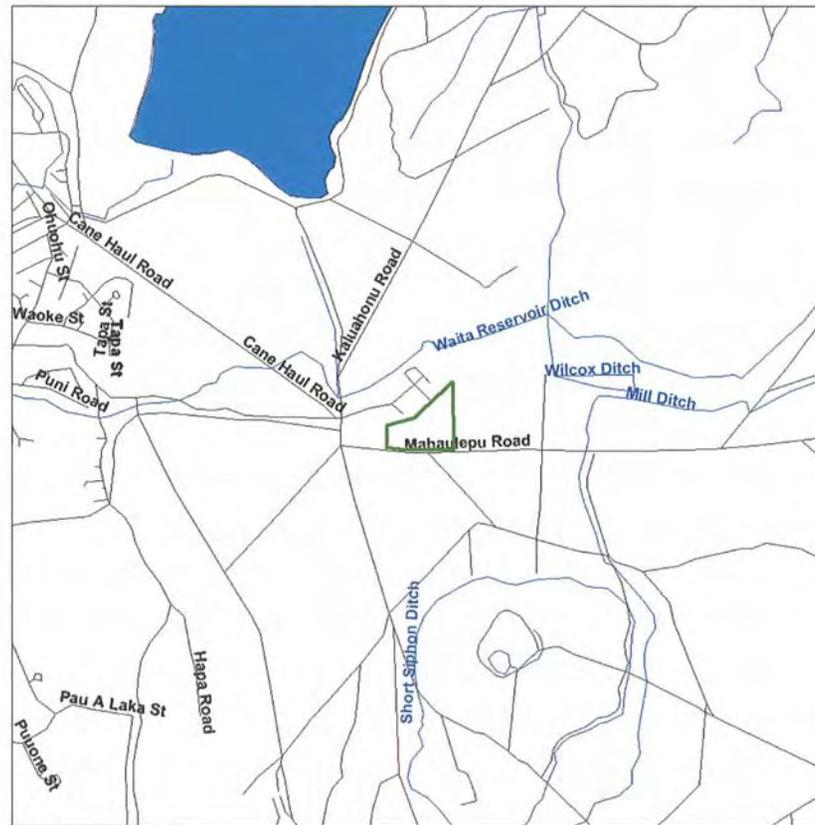


Environmental FirstSearch

1 Mile Radius from Area
ASTM-05: NPL, RCRACOR, STATE



MAHAULEUPU ROAD, KOLOA HI 96756



Source: U.S. Census TIGER Files

- Area Polygon
- Identified Site, Multiple Sites, Receptor
- NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste
- Triballand
- Railroads



Environmental FirstSearch

.5 Mile Radius from Area
ASTM-05: Multiple Databases



MAHAULEPU ROAD, KOLOA HI 96756



Source: U.S. Census TIGER Files

- Area Polygon
- Identified Site, Multiple Sites, Receptor
- NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste
- Triballand
- Railroads



Environmental FirstSearch

.25 Mile Radius from Area
ASTM-05: RCRAGEN, UST, OTHER



MAHAULEPU ROAD, KOLOA HI 96756



Source: U.S. Census TIGER Files

- Area Polygon
- Identified Site, Multiple Sites, Receptor
- NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste
- Triballand
- Railroads

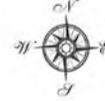


Environmental FirstSearch
 .12 Mile Radius from Area
 ASTM-05: SPILLS90, ERNS, RCRANLR, FIMAP
MAHAULEPU ROAD, KOLOA HI 96756



Source: U.S. Census TIGER Files

Area Polygon	
Identified Site, Multiple Sites, Receptor	
NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste	
Triballand	
Railroads	

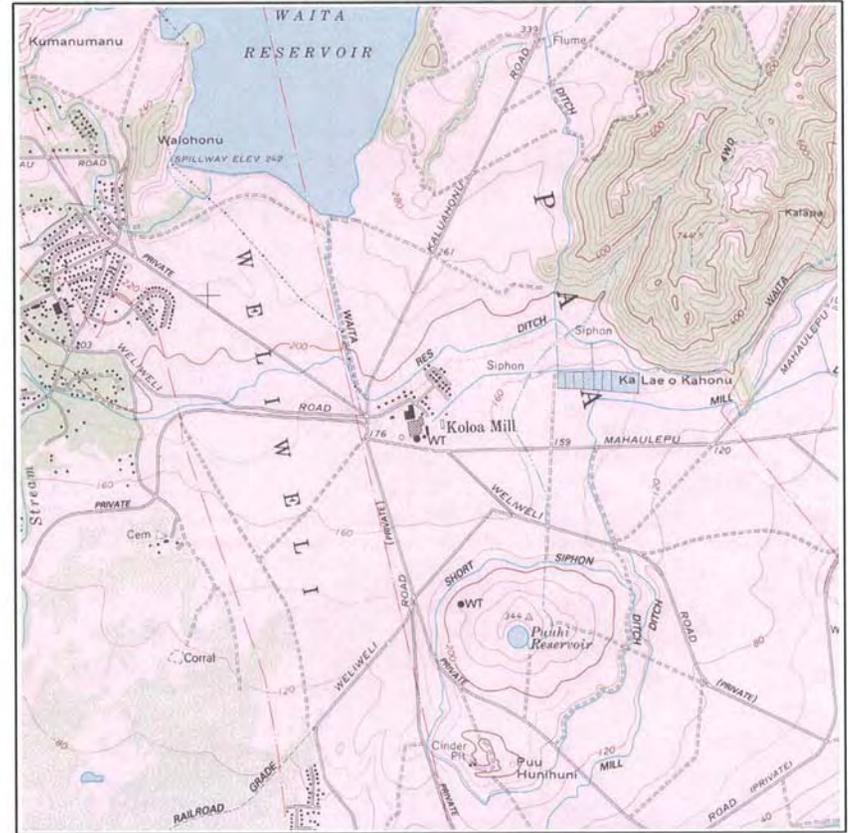


Track Info Services, LLC

Historical Topographic Map

Site: Mahaulepu Road, Koloa, HI 96756

Quadrangle Year: 1983



Building		Railroad		0	1/4	1/2	3/4	1 mile
Topo Contour		Tanks		Job Number: 50723 Original Scale of Full Topo: 1:24,000 Quadrangle Name: Koloa, HI				
Depression		Primary Highway						
Quarry or Open Pit Mine		Trail						

Copyright: Track Info Services, LLC

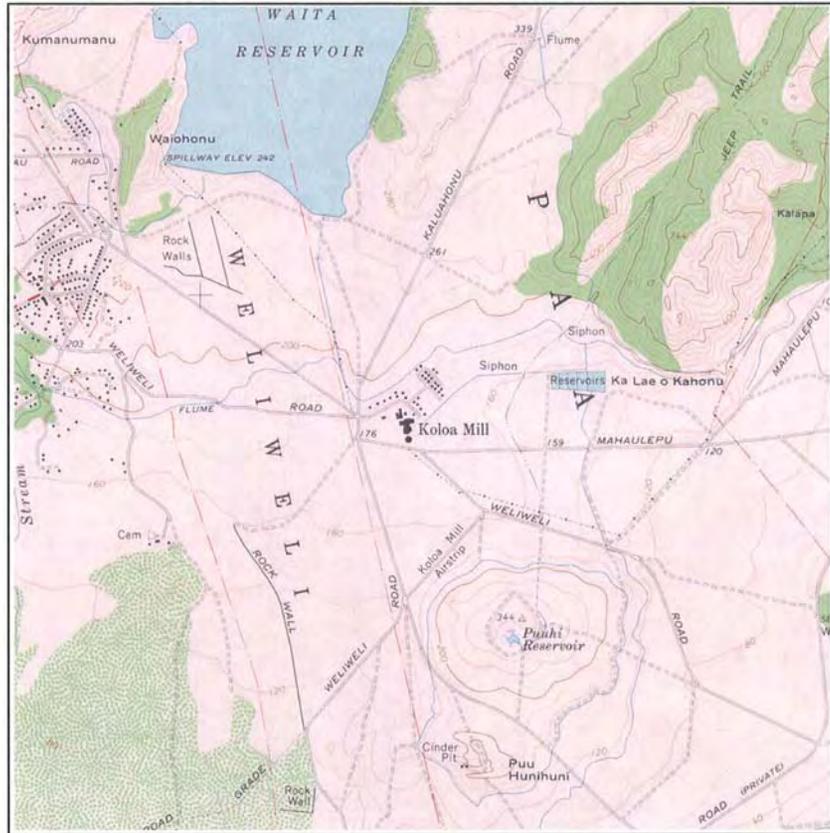


Track Info Services, LLC

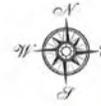
Historical Topographic Map

Site: Mahaulepu Road, Koloa, HI 96756

Quadrangle Year: 1963



Copyright: Track Info Services, LLC

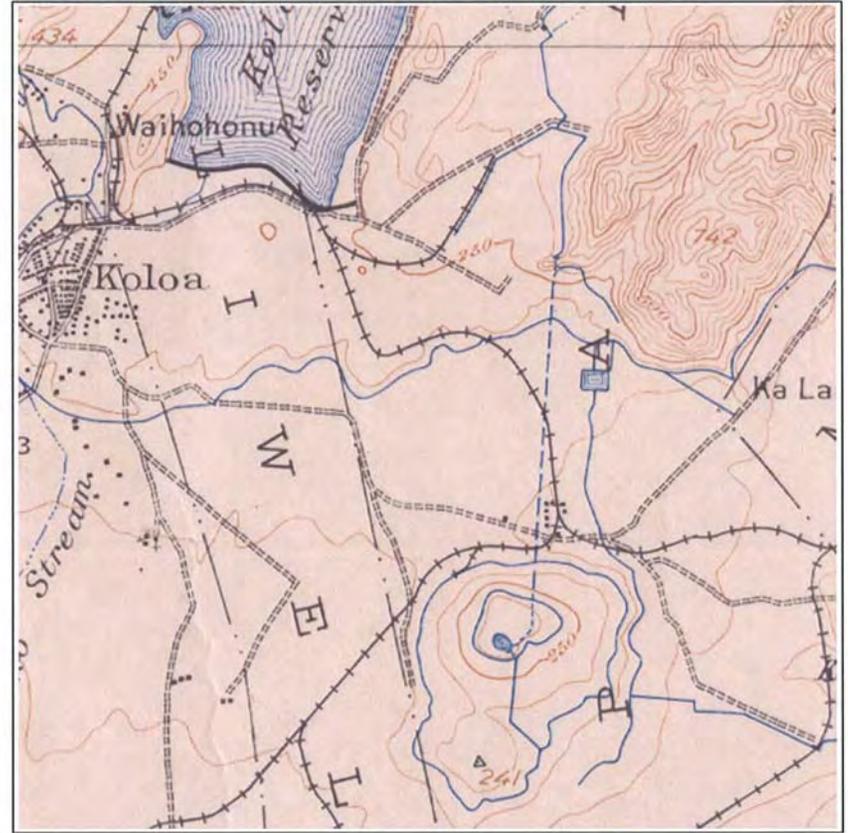


Track Info Services, LLC

Historical Topographic Map

Site: Mahaulepu Road, Koloa, HI 96756

Quadrangle Year: 1912



Copyright: Track Info Services, LLC

APPENDIX B
Site Reconnaissance Photographs

[50859]

B

Myounghee Noh & Associates, L.L.C.

Photograph 1. A view of the bagasse house to the right, and the water tank to the left, as viewed from Mahanlepu Road (April 20, 2009).



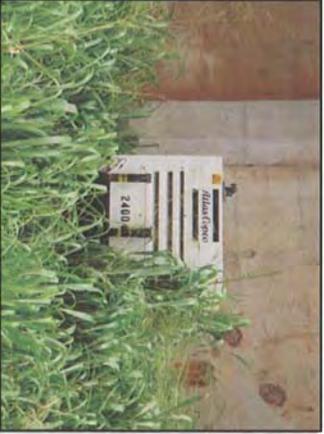
Photograph 2. A view of the bagasse house (April 20, 2009).



Photograph 3. A view of subject property Portion B, the settling pond, is visible in the background. The Wa'iala Enterprises excavated area is visible in the foreground (March 3, 2009).



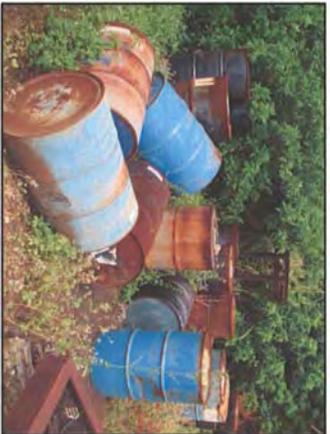
Photograph 4. A view of a portable generator observed on the exterior west wall of the bagasse house (April 20, 2009).



MANA 50723



B-1



Photograph 8. A view of drums observed east of the bagasse house. Approximately 30 drums were observed in this area (March 3, 2009).



Photograph 9. A view of two aboveground storage tanks (ASTs) observed southeast of the bagasse house (March 3, 2009).



Photograph 10. A view of six large vehicle batteries observed southeast of the bagasse house (March 3, 2009).



Photograph 11. A view of an AST located southwest of the bagasse house next to the pump house. The pump house is visible to the left and the water tank is visible behind the AST (April 20, 2009).



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B-3



Photograph 5. A view of the large motors observed to the east of the bagasse house (April 20, 2009).



Photograph 7. A view of a petroleum stained area observed beneath earth-moving equipment east of the bagasse house (March 3, 2009).



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B-2



Photograph 6. A view of vehicles observed to the east of the bagasse house on the baseyard operated by Walsani Enterprises (March 3, 2009).



Photograph 15. A view of more than 100 automotive batteries located in the Wa'alahi Enterprises base yard to the east of subject property Portion A. Many of the batteries observed were in poor condition (March 3, 2009).



Photograph 16. A view of a drum rack containing 55-gallon drums of petroleum product lubricants located in the Wa'alahi Enterprises base yard to the east of subject property Portion A. Petroleum product staining was observed beneath the drum rack (March 3, 2009).



Photograph 17. A view of a portable AST located in the Wa'alahi Enterprises base yard to the east of subject property Portion A. Soil staining was visible around the AST (March 3, 2009).

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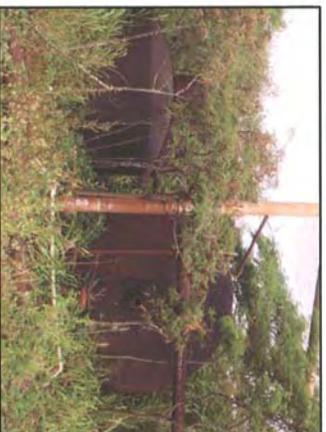
B-5



Photograph 12. A view of the interior of the pump house. The pump house contained a diesel powered generator and several large batteries (April 20, 2009).



Photograph 13. A view of the stored boat and abandoned vehicle to the southwest of the bagasse house (April 20, 2009).



Photograph 14. A view of the ASTs located to the northeast of the bagasse house. The ASTs were observed to be approximately 25 to 40 percent full of petroleum product (April 20, 2009).

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B-4



Photograph 21. A view of a transformer cage containing three large transformers located north of the subject property (April 20, 2009).



Photograph 22. A view of the mill located west of the subject property (April 20, 2009).



MNA 50723

Photograph 23. A view of electrical equipment observed in the mill (April 20, 2009).



B-7



Photograph 18. A view of a 55-gallon drum full of unknown contents observed north of subject property (April 20, 2009).



MNA 50723

Photograph 20. A view of a rusted out 55-gallon drum observed north of subject property (April 20, 2009).



Photograph 19. A view of a large suspect PCB-capacitor observed north of subject property (April 20, 2009).



B-6



Photograph 26. A view of the exterior section of the conveyor system observed north of the bagasse house (April 20, 2009).



Photograph 28. A view of the interior of the bagasse house. The conveyor system is visible to the right and top (April 20, 2009).



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Photograph 27. A view of the drainage trench located just south of the bunker fuel ASTs (March 3, 2009).

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Photograph 24. A view of a large motor observed in the mill (April 20, 2009).



MNA 50723



Photograph 25. A view of a pole-mounted transformer observed north of subject property Portion B. The transformer was observed in poor condition (March 3, 2009).

B-8

APPENDIX C

Qualifications of Environmental Professional

EVAN F. PFAFF, P.E.

EDUCATION:

Rutgers University
New Brunswick, NJ, USA
Graduated May 1996

Dual Degree Program, GPA: 3.78 on 4.0 scale

- B.S. Bioresource Engineering, College of Engineering
- B.S. Bioresource Engineering, Cook College

CERTIFICATIONS:

Professional Engineer, Civil, Washington State Registration No. 40879
Professional Engineer, Civil, Hawai'i State Registration No. 13112
HAZWOPER certified

EMPLOYMENT

Civil Engineer

**United States Department of Agriculture-Natural Resources
Conservation Service**

Pago Pago, American Samoa, USA

August 2001 - June 2003

- Provided engineering services for soil and water conservation projects
- Managed project budgets, communications, and documentation
- Ensured projects were designed and constructed to federal and local standards
- Researched and evaluated conservation practices for local agricultural systems
- Provided engineering assistance to local environmental management agencies
- Liaised with local cooperative groups to collaborate findings
- Supervised two junior staff members

Environmental Consultant

Seagate Technology

Scotts Valley, CA, USA

July 2001 - August 2001 (contract position)

- Managed environmental permits, performed evaluations, and provided recommendations on various site environmental issues

Junior Environmental Engineer

Earth Tech

San Jose, CA, USA

December 1999 - June 2001

- Participated in six major environmental engineering projects throughout Hawaii and California
- Investigated waste and water regulatory compliance issues and designed compliance solutions
- Designed civil engineering structures for the management of storm water, wastewater, and solid waste
- Managed project budgets, communications, and documentation
- Designed and implemented soil and storm water testing programs
- Prepared regulatory documentation

Water and Sanitation Engineer

Unites States Peace Corps

University of San Carlos, Water Resources Center, Cebu City, Philippines

April 1997 - June 1999

- Worked on projects to improve the delivery of domestic water and sanitation services
- Supervised the construction of water supply system infrastructure
- Conducted training seminars on water system management and maintenance



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