

Appendix A: Review of Wastewater Facility Regulations, Standards and Guidelines

Appendix A

Review of Wastewater Facility Regulations, Standards and Guidelines

1.1 General Wastewater Facility and Design

The operation of new or existing wastewater treatment facilities are strictly governed by public and environmental health regulations in order to protect the water quality and water uses of the state of Hawai'i. The 1972 Clean Water Act (CWA) was established to aim at reducing the pollutant discharges to waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Under the CWA various public health regulations were developed to govern current water quality standards and treated wastewater effluent limitations.

The State of Hawaii Department of Health (DOH) promulgated the following public health regulations under the Title 11 of the Hawaii Administrative Rules: Chapter 23 – *Underground Injection Control*, Chapter 54 – *Water Quality Standards*, Chapter 55 – *Water Pollution Control*, and Chapter 62 – *Wastewater Systems*. These regulations provide for control and monitoring of wastewater facilities, treatment and disposal, water quality and pollution, and the impact it has on the public health and the environment.

Based on Section 208 – *Areawide Waste Treatment Management* of the CWA, the City and County of Honolulu, with the assistance from the DOH, developed the *CWA Section 208 Water Quality Management Plans*. The plans were initially approved by the Environmental Protection Agency (EPA) in 1979 and 1980, and updated in 1993 to include descriptions of the Federal, State, and County roles in managing water pollution.

Also based on the CWA, The Federal Water Pollution Control Act provides for water pollution control activities in the public health service of the Federal Security Agency and in the Federal Works Agency. It states that the effluent discharged from a wastewater facility must satisfy the applicable restrictions and limitations on the quantities, rates, and physical, biological, and chemical concentrations being discharged. In addition, the discharge must not endanger the maintenance or attainment of applicable water standards. Water quality standards are also defined by limits of physical, biological, and chemical parameters which are not to be exceeded.

The following sections discuss the regulations, standards, and guidelines for wastewater facilities and how they apply to protecting Hawaii's water, public health, and environment.

1.2 Water Quality Standards

The water quality standards for the State are set forth by the DOH in the Hawaii Administrative Rules (HAR) Title 11 Chapter 54 (11-54), *Water Quality Standards*. This section establishes standards for various nutrient levels and physical parameters of the States receiving waters. State waters are all waters, fresh, brackish, or salt around and within the State of Hawaii. Excluded from the regulations of Chapter 54 are the following: groundwater, ditches, flumes, ponds, and reservoirs required as part of a pollution control system or which are used solely for irrigation waters.

Chapter 54 requires that existing uses, and the level of water quality necessary to protect the existing uses, shall be maintained and protected. All waters shall be free of substances attributable to domestic, industrial, or other controllable sources of pollutants.

Furthermore, State waters are classified as either inland waters or marine waters.

1.2.1 Inland Waters

Inland waters may be fresh, brackish, or saline. These waters can be further classified based on their ecological characteristics and other natural criteria. Table A-1 summarizes the classes of inland waters.

Table A-1. Inland Water Class	
Water Types	Ecological Systems
Fresh Waters	Flowing Waters <ul style="list-style-type: none"> • Streams (perennial or intermittent) • Flowing springs and seeps • Ditches and flumes that discharge into any other waters of the state
	Standing Waters <ul style="list-style-type: none"> • Natural freshwater lakes and reservoirs
	Wetlands <ul style="list-style-type: none"> • Elevated wetlands • Low wetlands
Brackish Waters or Saline Waters	Standing Waters <ul style="list-style-type: none"> • Anchialine pools • Saline Lakes
	Wetlands <ul style="list-style-type: none"> • Coastal wetlands
	Estuaries <ul style="list-style-type: none"> • Natural estuaries • Developed estuaries

Chapter 54 also establishes two classes of water uses for inland waters, and sets standards and definitions for appropriate water quality parameters to protect these inland waters. The most important element of the regulations for wastewater treatment planning pertains to wastewater discharges. Wastewater discharges into Class 1 inland waters is prohibited, and wastewater discharges into Class 2 inland waters is controlled.

1.2.2 Marine Waters

Marine waters are either embayments, open coastal, or oceanic waters. These waters can be further classified based on their bottom subtypes. Table A-2 summarizes the classes of marine waters.

Table A-2. Marine Water Class	
Water Types	Bottom Subtypes
Embayments or Open Coastal Waters	<ul style="list-style-type: none"> • Sand beaches • Lava rock shorelines and solution benches • Marine pools and protected coves

- Artificial basins
- Reef flats
- Soft bottoms

Chapter 54 also establishes two classes for water uses for marine waters, and sets standards and definitions for appropriate water quality parameters to protect these marine waters. The most important element of the regulations for wastewater treatment planning pertains to wastewater discharges. In Class AA marine waters, zones of mixing are permitted only beyond certain areas and depths. Wastewater discharges into Class A marine waters is controlled. Locations of the various water use classifications are shown in Figure A-1.

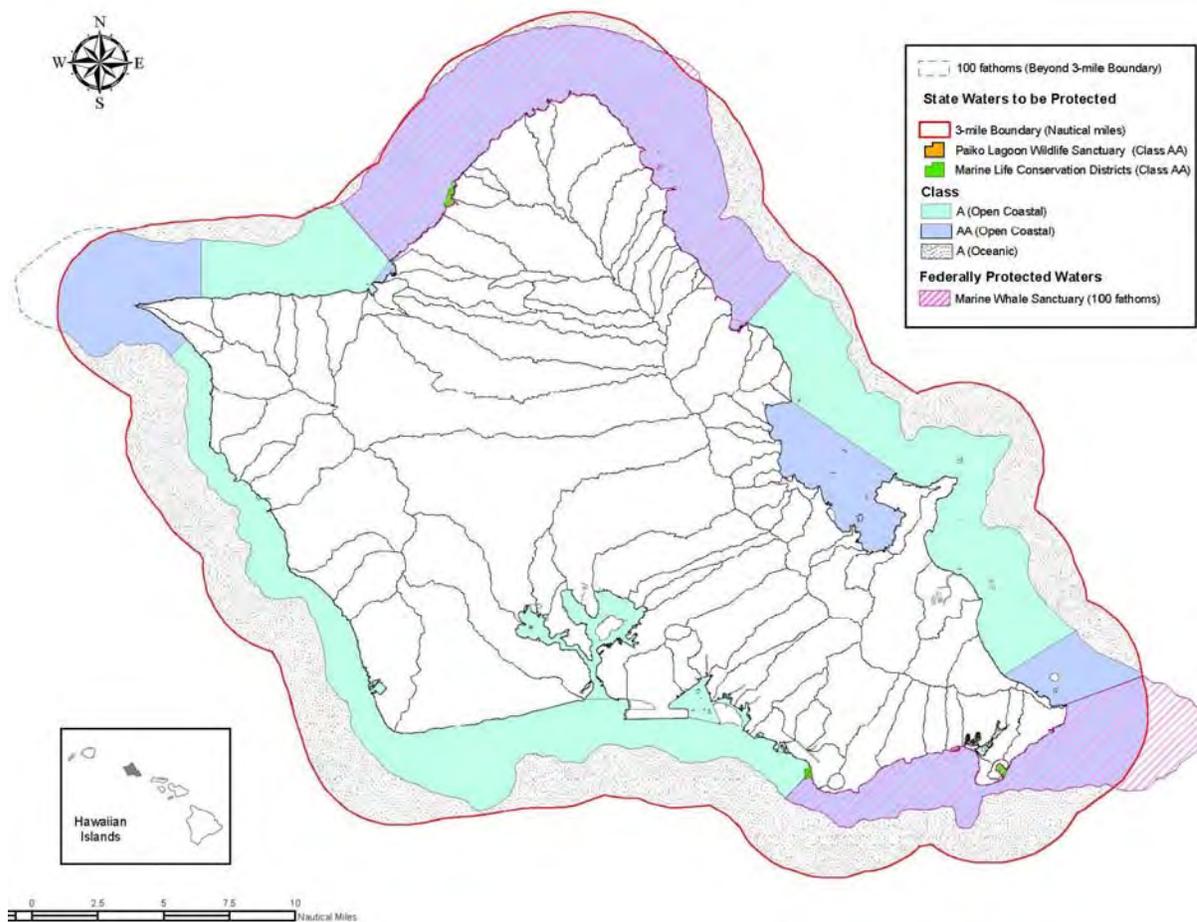


Figure A-1: Marine Water Classifications

Source: Hawaii DOH

1.3 Discharge Permits

Based on the Clean Water Act requirements to reduce pollutant discharges to waterways, the DOH established the Hawaii Administrative Rules (HAR) 11-55, *Water Pollution Control*, aimed to conserve,

protect, maintain, and improve the quality of state waters. No wastewater can be discharged into any state waters without first being properly treated to the degree necessary to protect these state waters.

Effluent discharged from a wastewater treatment facility must satisfy two standards. The first standard restricts and limits the quantities, rates, and physical, biological, and chemical concentrations being discharged. The second is a receiving water quality standard, which establishes limiting values for physical, biological, and chemical parameters that define the water quality.

The National Pollutant Discharge Elimination System (NPDES) was established by the 1972 Amendments to the Federal Water Pollution Control Act (FWPCA) to control the discharge of all effluents into the nation's waters. The DOH administers the NPDES permit requirements under the provisions of HAR 11-55. A NPDES permit must be obtained before discharging any pollutant or substantially altering the quality of any discharges. The NPDES permit process monitors and regulates discharge quantity and quality and enforces pretreatment requirements. There are twelve NPDES permits (Appendix A-L), each authorizing specific types of discharging. Depending on the discharge and situation, multiple NPDES permits might be required.

1.4 Groundwater Protection

Regulations help to protect the groundwater and the quality of underground water resources from pollution resulting from fluid discharge. Two programs, the underground injection control (UIC) program and the Oahu "No-Pass" line program were established to protect water quality and regulate discharges into these underground water resources.

1.4.1 Underground Injection Control

Wells used to discharge fluid into the ground are considered underground injection wells. The DOH Safe Drinking Water Branch administers the Hawaii Administrative Rules (HAR) 11-23, *Underground Injection Control*. The intent of the underground injection control (UIC) program is to protect the quality of the State's underground drinking waters sources from pollution by subsurface disposal of fluids. These regulations specify conditions governing the location, construction and operation of injection wells.

The DOH established an UIC line that delineates areas of control. Areas below the UIC line are not considered drinking water sources and a wider variety of wells are permitted for water discharge. Areas above the UIC line are considered drinking waters sources. Though some specific cases are permitted, underground injection wells above the UIC line are typically prohibited. Permits for injection wells are required in both areas, and permit limitations are very restrictive in the area of drinking water sources.

1.4.2 Oahu "No-Pass" Line

The Board of Water Supply (BWS), City and County of Honolulu, *Rules and Regulations, Chapter III, Protection, Development and Conservation of Water Resources*, established a "No-Pass" program. Similar to the UIC program, the intent of the "No-Pass" program is to protect the quality of the underground water resources based on promulgated rules and regulations on wastewater disposal facilities. These facilities include cesspools, septic tank systems, household aerobic treatment units, disposal wells, stabilization ponds, and sewage treatment plants.

In accordance with these regulations, the BWS established a "No-Pass" line. In areas makai of the "No-Pass" line, all types of disposal systems (which meet suitable treatment standards) are acceptable to the BWS. Disposal above the "No-Pass" line is subject to careful review to ensure that no threat to groundwater supplies occurs. The "No-Pass" line is more restrictive than the UIC lines.

1.5 Effluent Reuse

Water reuse in Hawaii is regulated by the DOH Wastewater Branch under the Hawaii Administrative Rules (HAR) 11-62, *Wastewater Systems*. The HAR 11-62 includes guidelines for wastewater treatment and the use of recycled water. There are three classifications of recycled water: R-1, R-2, and R-3. These classifications are based on the degree of treatment and subsequent effluent quality, which in turn governs applicable use. Definitions for each class of recycled water are provided below.

1.5.1 R-1 Water

- The highest quality of the three classes.
- Must be oxidized, filtered, and disinfected.
- Undergoes a significant reduction in viral and bacterial pathogens.
- Median fecal coliform density does not exceed 2.2 per 100 mL for the last 7 days of analyses.
- Maximum fecal coliform density does not exceed 23 per 100 mL in more than one sample in any 30 day period.
- No sample shall exceed 200 fecal coliform per 100 mL.

1.5.2 R-2 water

- Must be oxidized and disinfected.
- Median fecal coliform density does not exceed 23 per 100 mL for the last 7 days of analyses
- Maximum fecal coliform density does not exceed 200 per 100 mL in more than one sample in any 30 day period.

1.5.3 R-3 water

- Oxidized, but not disinfected.

The definitions outlined above clearly show that microbiological quality is the main emphasis for the recycled water classification. Since the most common use of recycled water is irrigation, human exposure to potential pathogenic organisms is a concern. As the quality of recycled water increases, the restrictions on its use decreases. General precautions for all uses of recycled water are explained in the Hawaii Department of Health's Guidelines for the Treatment and Use of Recycled Water (May 15, 2002). Table A-3 shows the potential applications for each water classification.

Table A-3. Reuse Guidelines, Summary of Suitable Uses for Recycled Water			
Suitable Uses of Recycled Water	R1	R2	R3
IRRIGATION: (S)pray, (D)rip & Surface, S(U)bsurface, (A)LL=S, D & U, Spray with (B)uffer, (N)ot allowed, /-or			
Golf course landscapes	A	U/B	N
Freeway and cemetery landscapes	A	A	N
Food crops where recycled water contacts the edible portion of the crop, including all root crops	A*	N	N
Parks, elementary schoolyards, athletic fields and landscapes around some residential property	A	U	N
Roadside and median landscapes	A	U/B	N
Non-edible vegetation in areas with limited public exposure	A	AB	U
Sod farms	A	AB	N
Ornamental plants for commercial use	A	AB	N
Food crops above ground & not contacted by irrigation	A	U	N

Table A-3. Reuse Guidelines, Summary of Suitable Uses for Recycled Water			
Suitable Uses of Recycled Water	R1	R2	R3
Pastures for milking and other animals	A	U	N
Fodder, fiber, and seed crops not eaten by humans	A	AB	DU
Orchards and vineyards bearing food crops	A	D/U	DU
Orchards and vineyards not bearing food crops during irrigation	A	AB	DU
Timber and trees not bearing food crops	A	AB	DU
Food crops undergoing commercial pathogen destroying process before consumption	A	AB	DU
Supply to Impoundments: (A)llowed (N)ot allowed			
Restricted recreational impoundments	A	N	N
Basins at fish hatcheries	A	N	N
Landscape impoundments without decorative fountain	A	A	N
Landscape impoundments with decorative fountain	A	N	N
Supply to other uses: (A)llowed (N)ot allowed			
Flushing toilets and urinals	A	N	N
Structural fire fighting	A	A	N
Nonstructural fire fighting	A	A	N
Commercial and public laundries	A	N	N
Cooling saws while cutting pavement	A	N	N
Decorative fountains	A	N	N
Washing yards, lots and sidewalks	A	N	N
Flushing sanitary sewers	A	A	N
High pressure water blasting to clean surfaces	A	N	N
Industrial Process without exposure of workers	A	A	N
Industrial Process with exposure of workers	A	N	N
Cooling or air conditioning system without tower, evaporative condenser, spraying, or other features that emit vapor or droplets	A	A	N
Cooling or air conditioning system with tower, evaporative condenser, spraying, or other features that emit vapor or droplets	A	N	N
Industrial boiler feed	A	A	N
Water jetting for consolidation of backfill material around potable water piping during water shortages	A	N	N
Water jetting for consolidation of backfill material around piping for recycled water, sewage, storm drainage, and gas; and electrical conduits	A	A	N
Washing aggregate and making concrete	A	A	N
Dampening roads and other surfaces for dust control	A	A	N
Dampening brushes and street surfaces in street sweeping	A	A	N

**Allowed under the following conditions:*

The turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes. The UV disinfection unit must conform to Appendix K: UV Disinfection Guidelines for R-1 Water.

Source: State of Hawaii, Department of Health. Guidelines for the Treatment and Reuse of Recycled Water, May 15, 2002

1.6 Biosolids Disposal

Biosolids (i.e. sludge or solid waste) disposal, handling, or use must comply and meet quantity and quality regulations. Several standards and regulations were developed by agencies to help govern the disposal of biosolids.

1.6.1 Sludge Disposal

The U.S. Environmental Protection Agency Title 40 Part 503 (EPA 503), *Standards for the Use or Disposal of Sewage Sludge* established standards which consist of general requirements, pollutant limits, management practices, and operational standards for the final use or disposal of sewage sludge generated during the treatment of domestic sewage. Sewage sludge applied to the land, placed on a surface disposal site, or fired by incineration shall meet with EPA 503 standards.

The DOH Wastewater Branch, Hawaii Administrative Rules (HAR) 11-62, *Wastewater Systems 11-62* follow the EPA 503 standards but is more stringent. It states that no wastewater sludge, generation, treatment, preparation, storage, hauling, application, placement, use, or disposal shall be conducted unless allowed by HAR 11-62, even if allowed under EPA 503. Permits and agency approval are required before any sludge disposal is performed.

1.6.2 Disposal Facilities

The U.S. Environmental Protection Agency Title 40 Part 257 (EPA 257), *Criteria for Classification of Solid Waste Disposal Facilities and Practices* established standards, in conjunction with the Resource Conservation and Recovery Act (RCRA), which ensure solid waste disposal facilities and practices do not have adverse effects on health or the environment, and also ensures that non-municipal non-hazardous waste disposal units do not present risks to human health and the environment. EPA 257 also provides guidelines for the disposal of sewage sludge on the land when the sewage is not used or disposed through a practice regulated in EPA 503. Unless exempt to criteria stated in EPA 257, these standards apply to all solid waste disposal facilities and practices.

1.6.3 Solid Waste Landfills

The U.S. Environmental Protection Agency Title 40 Part 258 (EPA 258), *Criteria for Municipal Solid Waste Landfills* established minimum national criteria under the Resource Conservation and Recovery Act (RCRA) for all municipal solid waste landfills (MSWLF) and under the Clean Water Act for municipal solid waste landfills that are used to dispose of sewage sludge. These minimum national criteria ensure the protection of human health and the environment. They apply to all owners and operators of new, existing, or lateral expansion MSWLF.

1.6.4 Reuse

Beneficial biosolids reuse alternatives fall into two categories, agricultural and non-agricultural. Required levels of treatment for agricultural reuse alternatives are governed by EPA 503 and by HAR 11-62. There are three classifications of biosolids defined by the EPA 503 Rules; Class B, Class A and Class A Exceptional Quality (EQ). Land application of Class B biosolids are restricted to crops that are not directly consumed by or come into contact with the public. Class A and Class A EQ biosolids are suitable for unrestricted use. EPA 503 rules identify several methods for achieving Class A biosolids. Processes that would produce Class A biosolids include composting, thermal drying, pasteurization, high pH treatment, and high temperature digestion.

Non-agricultural reuse alternatives include direct energy production or conversion to fuel, construction materials as an aggregate or backfill material, and landfill alternative daily cover (ADC). Because of limited landfill space, use as landfill ADC is considered a secondary alternative only when other alternatives are not feasible.

1.7 Individual Wastewater Systems

Individual Wastewater Systems (IWS) are regulated by the Hawaii State DOH Wastewater Branch under the Hawaii Administrative Rules (HAR) 11-62, *Wastewater Systems*. An IWS is an independent system located within an individual property, having all of its plumbing, treatment, and disposal components separate from any other wastewater system.

HAR 11-62 discusses criteria and guidelines for use of IWS. A minimum of 10,000 square feet of land area for each IWS is required and the total wastewater flow into each IWS cannot exceed 1,000 gallons per day. Wastewater into an IWS from buildings other than dwellings must meet water quality standards and local pollutant limits. Before use and operation of an IWS, a permit must be obtained, the IWS must be operated and maintained in accordance with all HAR 11-62 provisions, and the IWS must be authorized in writing by a director of DOH.

Appendix B-1: Climate

Appendix B-1

Climate

Winds

National Weather Service data collected at the Dillingham Airfield site in Mokuleia indicate the prevailing winds in the Waiialua District come from the northeast through southeast directions about 80% of the time. Over the open ocean the tradewinds have a somewhat more northerly component than those recorded at Mokuleia. This could be due to influences from the nearby Waianae Mountains. Similar local influences undoubtedly affect winds elsewhere in the district, and winds at other locations will vary accordingly. There also appears to be a prevailing daily wind pattern. At sunset, the wind shifts and appears to come from a more easterly direction and is labeled as the Schofield wind (Belt Collins).

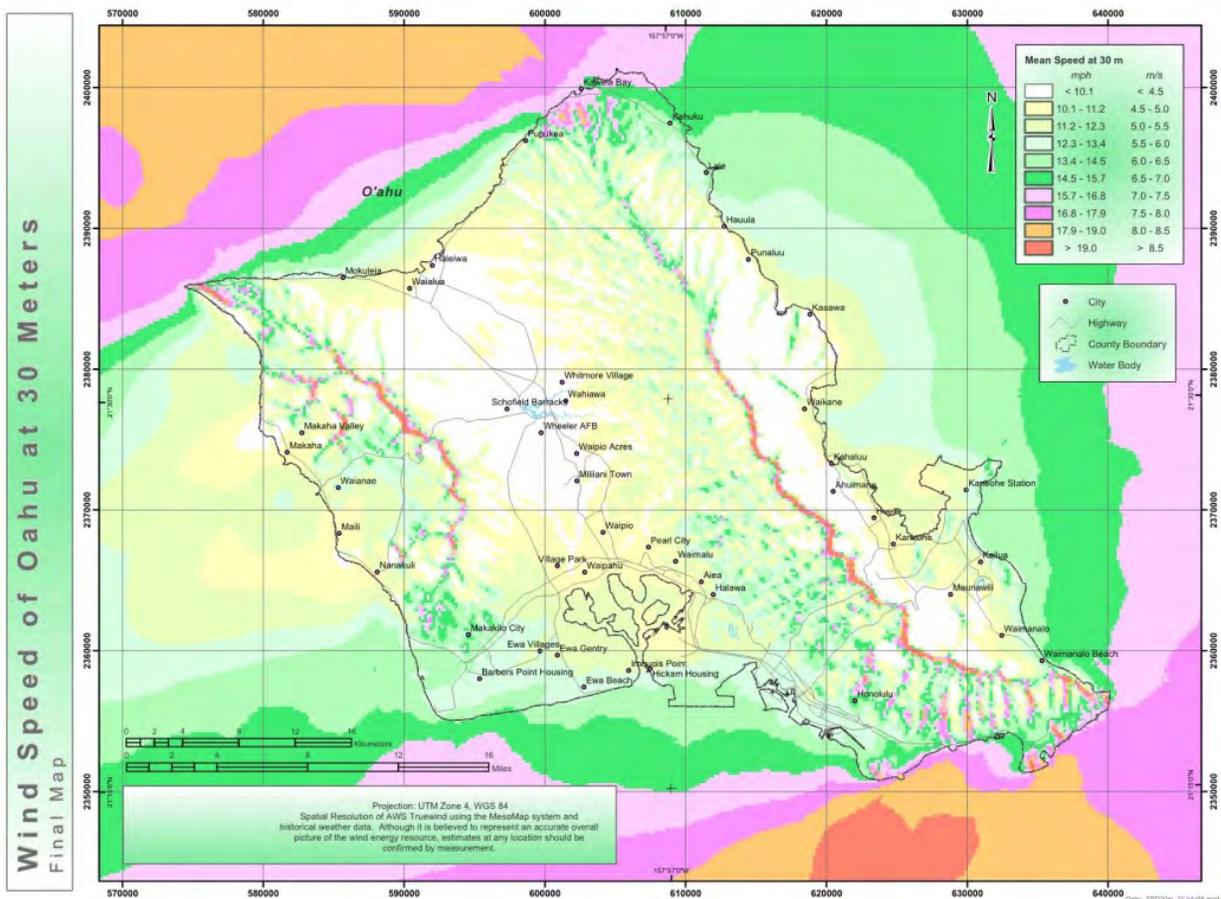


Figure B-1.1. Wind Speed of Oahu at 30m

Source: Hawaii Dept. of Business, Economic Development & Tourism

Wind speed also varies somewhat on a seasonal basis. Winds greater than 12 miles per hour (mph) occur less frequently during the winter than during the summer (e.g., 30% in January versus 70% in August). While there are more calms in the winter, winter storms generate the strongest gusts (about 70 mph). Figure B-1.1 shows wind speeds on and around the island of Oahu at a height of 30m above ground. Through most of the region, wind speeds vary up to 12 mph, whereas in the areas around Kaena Point and Kawela Bay, average speeds vary between 14 – 18 mph.

Temperature

The mean annual temperature for Haleiwa is 73°F, and the seasonal variation is slight as can be seen in Figure B-1.2. During the coldest month of February, the mean monthly temperature is about 69°F; during the warmest months of August and September it is about 77°F. The low of record in Haleiwa is 46°F in February of 1983. The highest temperature ever recorded in Haleiwa is 96°F in August of 1986.



Figure B-1.2. Average Monthly Temperatures for Haleiwa, HI

Source: Weather.com

Precipitation

Mean annual rainfall in Waialua and Haleiwa is about 35 inches (USDA/NRCS). However, rainfall within the Waialua District exhibits great spatial variability, largely as a result of the orographic effects of terrain. Near the crest of the Koolau Mountains, the mean annual rainfall is close to 300 inches, or ten times the amount received at Waialua on the coast (Belt Collins). Figure B-1.3 shows the average monthly precipitation distribution in Haleiwa.



Figure B-1.3. Average Monthly Precipitation for Haleiwa, HI

Source: Weather.com

Humidity/Class A Pan Evaporation

Average daily maximum humidity at Waialua is 80%; the average minimum humidity is 65%. Most of the daily fluctuation comes as a result of changes in ambient air temperature rather than changes in the vapor pressure. Hence, the minimum relative humidity tends to occur in the daytime and the maximum at night. According to Figure B-1.4, the mean annual Class A pan evaporation rate in the vicinity of Waialua and Haleiwa ranges between about 64 to 72 inches. Maximum evaporation rates (7.5 to 8.5 inches per month) occur during the summer; in December and January the average loss is about 3.5 to 4 inches per month.

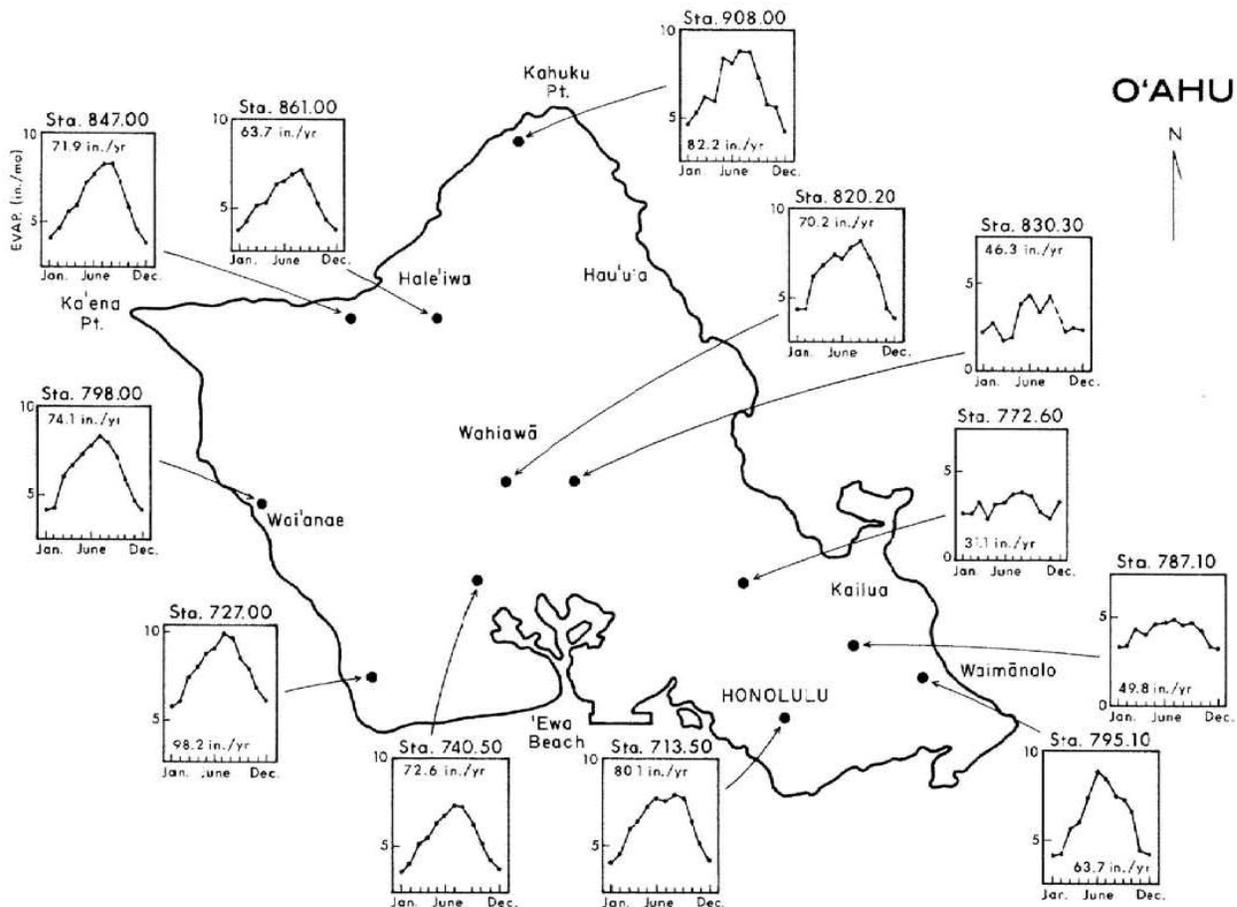


Figure B-1.4. Pan Evaporation Data for Oahu

Source: *Guidelines for the Reuse of Gray Water, 2009, Hawaii DOH*

The 1996 Hydro Resources report contained precipitation and pan evaporation data for Mokuleia. Figure B-1.5 shows a bar chart of average monthly rainfall and Pan Evaporation. For the Mokuleia area there is about 32 inches of rainfall a year and 70 inches of pan evaporation. The wettest period of the year, November through March, is the period of minimum irrigation requirement. The key to irrigation management is the number of days without significant precipitation. Quite often wet season pacing of storms still presents opportunities to irrigate. It is important to have flexibility in terms of storage and application rate to optimize the irrigation of targeted plants.

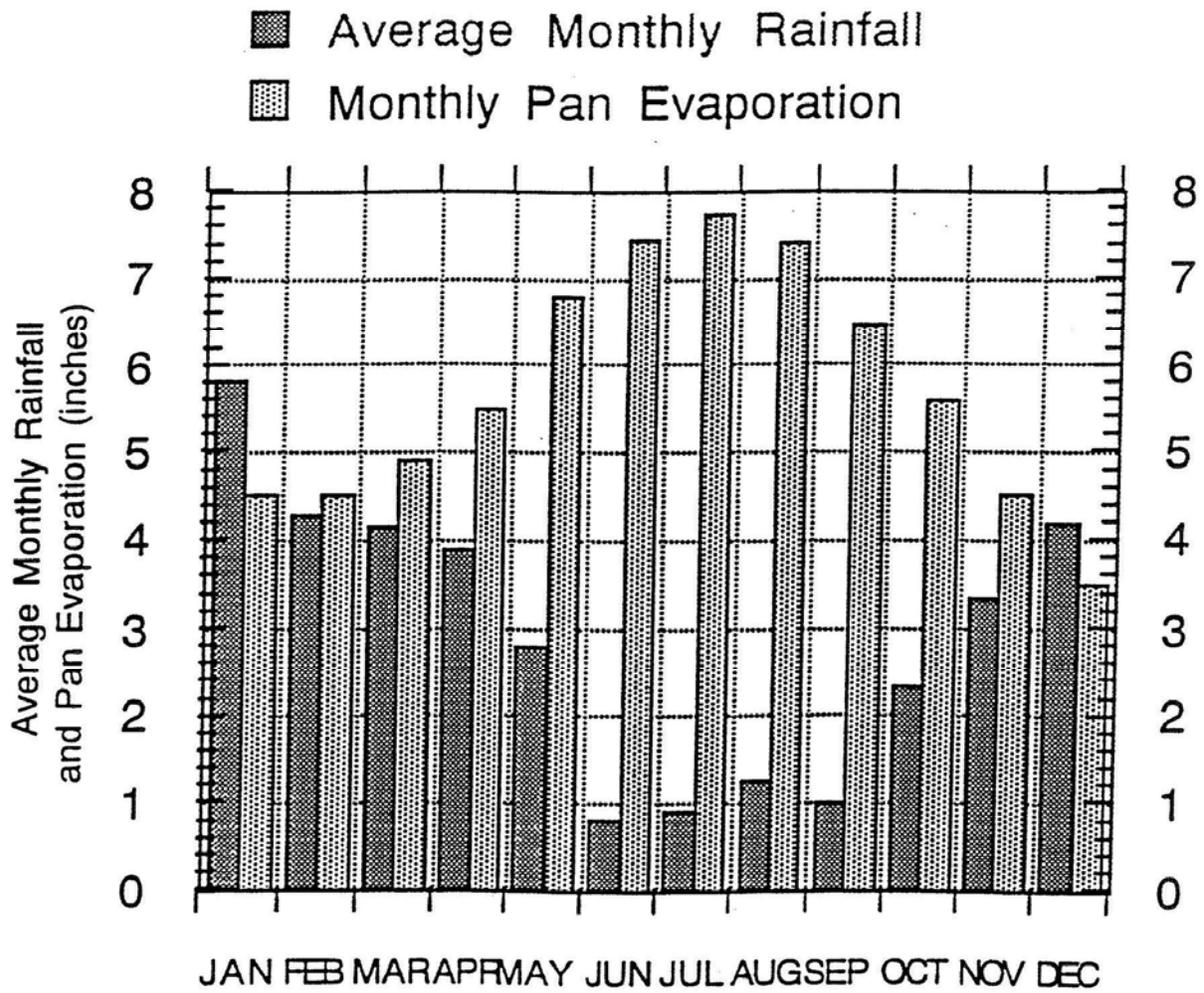


Figure B-1.5. Average Monthly Rainfall and Pan Evaporation, Mokuleia District

Source: Supplemental Waialua - Haleiwa Wastewater Facilities Plan, 1996, Hydro Resources

Appendix B-2: Geology and Soils

Appendix B-2

Geology and Soils

The U.S. Department of Agriculture, Soil Conservation Service (August 1972) has identified three soil associations within the Mokuleia, Waialua, Haleiwa, and Kawaihoa sub-districts. The Tropohumults-Dystrandeps association is found on the east side of the Waianae Range. These soils are gently sloping to very steep and are well drained. There are ten soil types in this association, however, the Tropohumults and Dystrandeps account for 55% of the total. Since this association is composed of mostly steep and inaccessible land, these soils are used primarily for watershed, although some of the soils that comprise a minor portion of this association have been used for woodland, pasture, pineapple, or sugarcane.

The Helemano-Wahiawa association comprises the soils of the central plateau. These deep soils are nearly level to moderately sloping, and are well drained. They occur in broad flat areas dissected by steep gullies. Overall, the Helemano soils make up about 40% of the association, are found on the sides of gulches, and have been primarily used for pasture. The Wahiawa soils form 30% of the association, are located on the broad upland areas, and have been used largely for sugarcane and pineapple. Three other soils series complete the remaining 30% of the association.

The coastal plain has soils of the Kaena-Waialua association. These are formed in alluvium and have widely varying texture and drainage characteristics. In general, the Kaena and Waialua soils are 50% of the association, while the remainder is split among eleven other soil series. This association has been used for sugarcane, truck crops, pasture, orchard, recreation and urban development.

The specific soils on which urban development within the planning area occurs are Jaucus sand (JaC), Ewa silty clay loam (EaB), Fill land (Fd), Haleiwa silty clay (HeA), Kawaihapaai clay loam (K1A and K1B), Keaau clay (KmA and KmB), Mamala stony silty clay loam (MnC), Mokuleia loam (Ms), Waialua silty clay (WkA), Waialua stony silty clay (WIB), and Waipahu silty clay (WzA). Figures B-2.1 through B-2.5 show the various soil distributions in the Mokuleia, Waialua, Haleiwa, Kawaihoa, and Pupukea/Sunset Beach sub-districts, respectively. Selected characteristics of these and other soils in the study area are shown in Table B-2.1.

Only the soils marked with an “asterisk” are listed by the U.S. Department of Agriculture’s Soil Conservation Service (August 1972), as having all features favorable for foundations of low buildings. The others mentioned above are listed as having slight to serious limitations for this use.

The capability classification shown for each soil type in the table indicates its general usefulness for agriculture. Capability is rated by roman numerals I through VIII, a higher number indicating greater limitations on the use of the soil for agriculture. The subclasses are designated by one of four letters after the roman numeral. These subclasses and their meanings are:

e - there is risk of erosion

w - there is water in the soil

s - the soil is shallow or stony

c - the climate is too dry.

Two soils series in the planning area that can be marshy are the Haleiwa and Tropaquept soils. Generally, the Tropaquepts are “poorly drained soils that are periodically flooded by irrigation in order to grow crops that thrive in water,” (U.S. Department of Agriculture, Soil Conservation Service, August, 1972:121). The Haleiwa series are found on alluvial fans or along drainage ways of the coastal plain.

They are usually well drained but included in the Haleiwa silty clay mapping unit (HeA) as “areas of poorly drained clayey soils in depressions,” (U.S. Department of Agriculture, Soil Conservation Service, August 1972). The area northeast of Lokoea Pond is classified as a marsh (MZ).

The soils series present in the developed areas that the Soil Conservation Service has classified as having severe limitation for septic tank leaching fields are Kaena (KaB, KaeB, KaeC, and KaeE); Keaau (KmA and KmbA); Kemoo (KpF); Mamala (Mnc); Pearl Harbor (Ph); Tropaquepts (TR); and Waipahu (WzA). Figures B-2.6 through B-2.8 show the extent of agricultural lands in the areas of Mokuleia, Waialua and Haleiwa. The State Department of Agriculture (1977) has designated most of the arable acreage in the Waialua District as either “prime agricultural land” or “other important agricultural land”. The total area of significant agricultural lands that exist in the district is 24,200 acres.

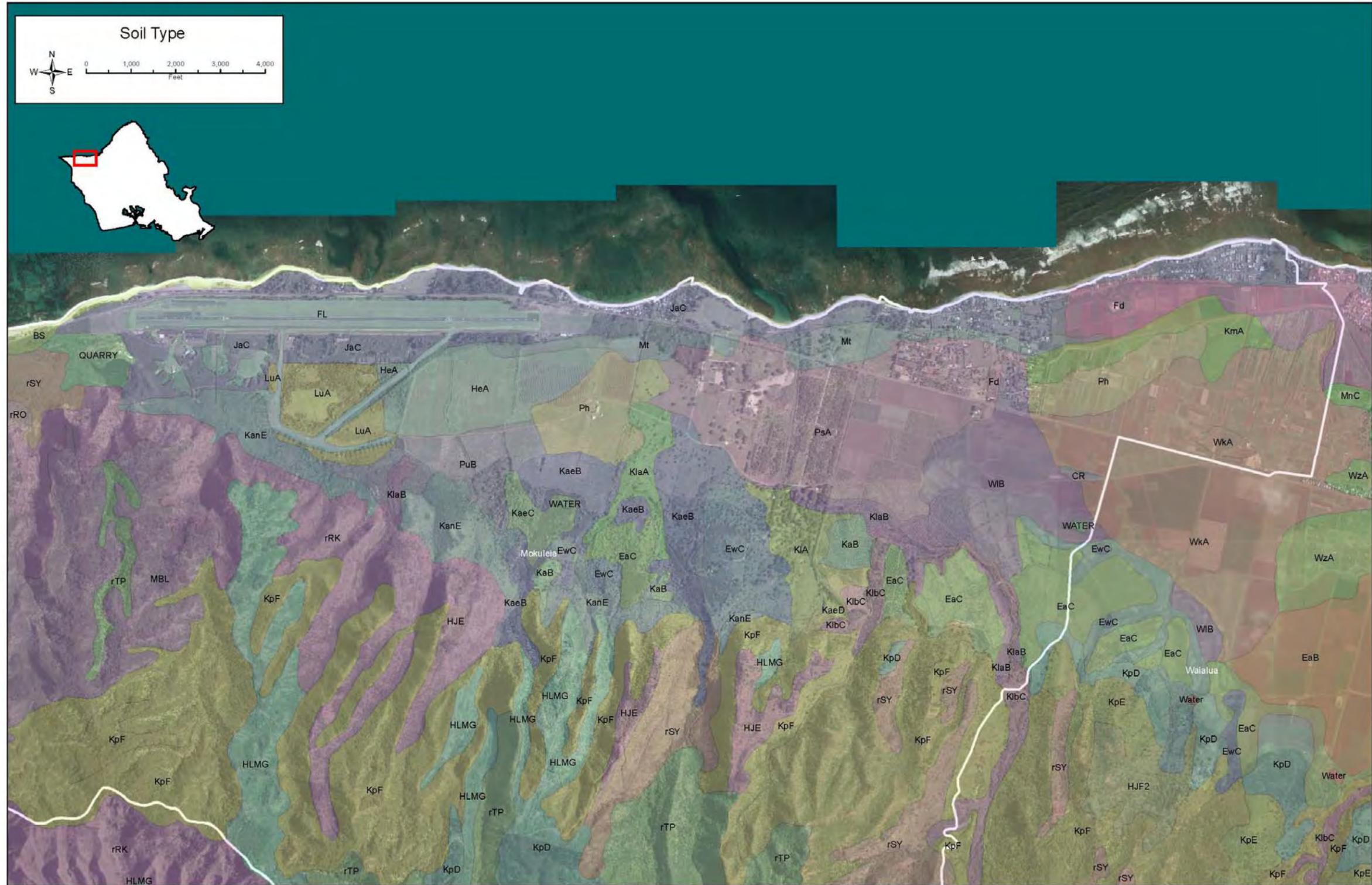


Figure B-2.1. Soils in the Mokuleia Area

Source: Hawaii Statewide GIS Program



Figure B-2.3. Soils in the Haleiwa Area

Source: Hawaii Statewide GIS Program



Figure B-2.4. Soils in the Kawaiiloa Area

Source: Hawaii Statewide GIS Program



Figure B-2.5. Soils in the Pupukea/Sunset Beach Area

Source: Hawaii Statewide GIS Program

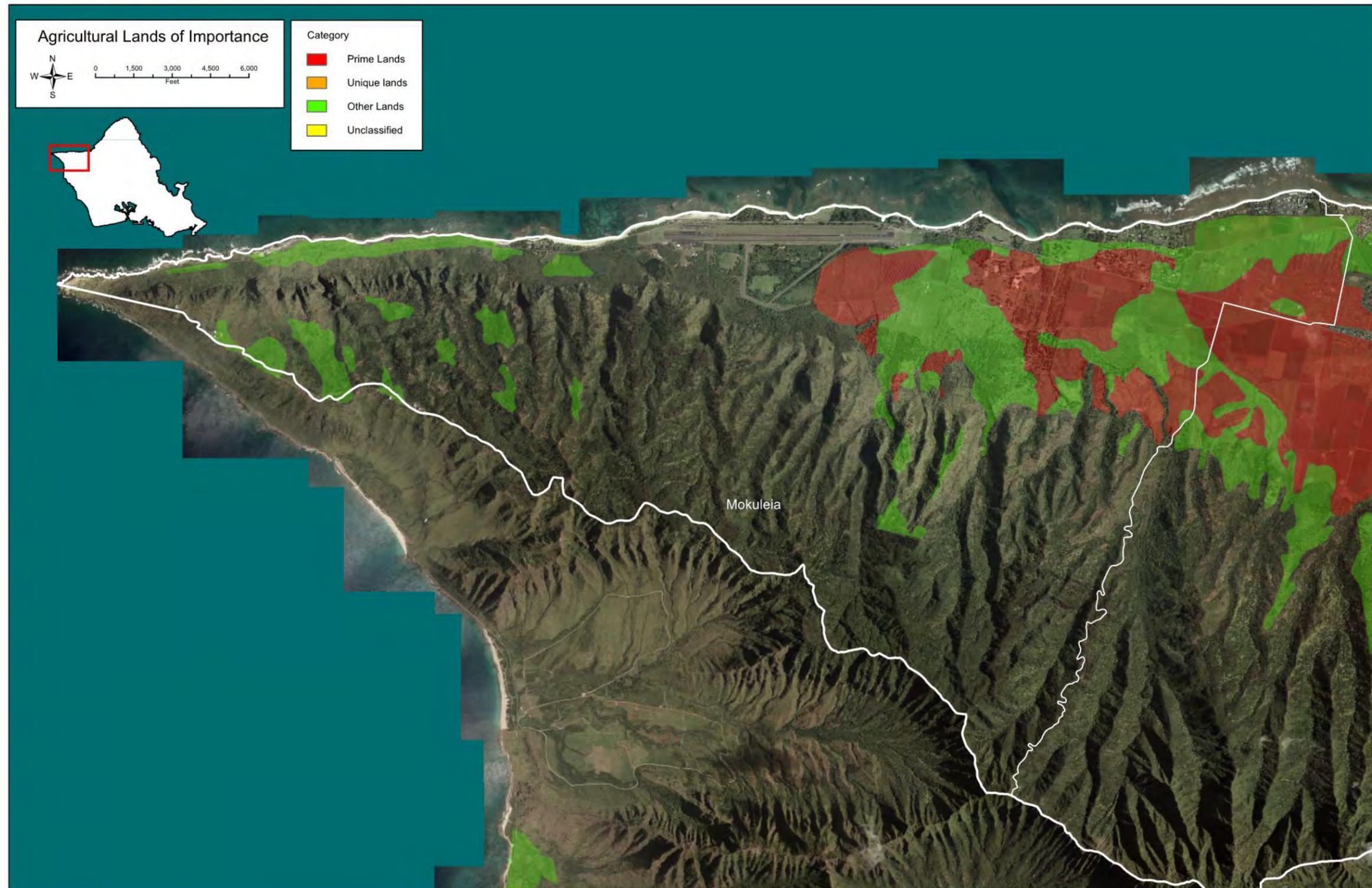


Figure B-2.6. Agricultural Lands of Importance – Mokuleia

Source: Hawaii Statewide GIS Program

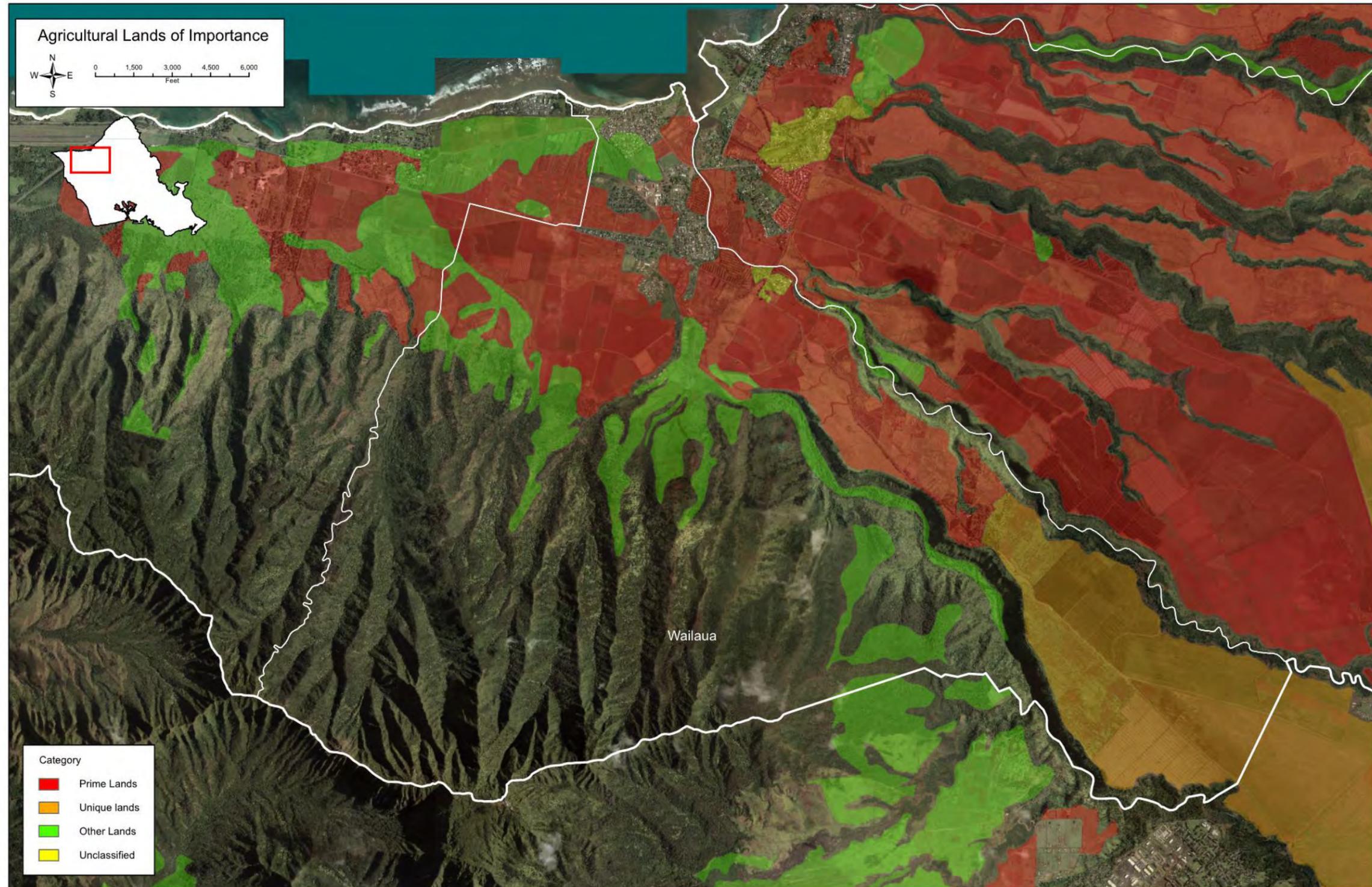


Figure B-2.7. Agricultural Lands of Importance – Waialua

Source: Hawaii Statewide GIS Program

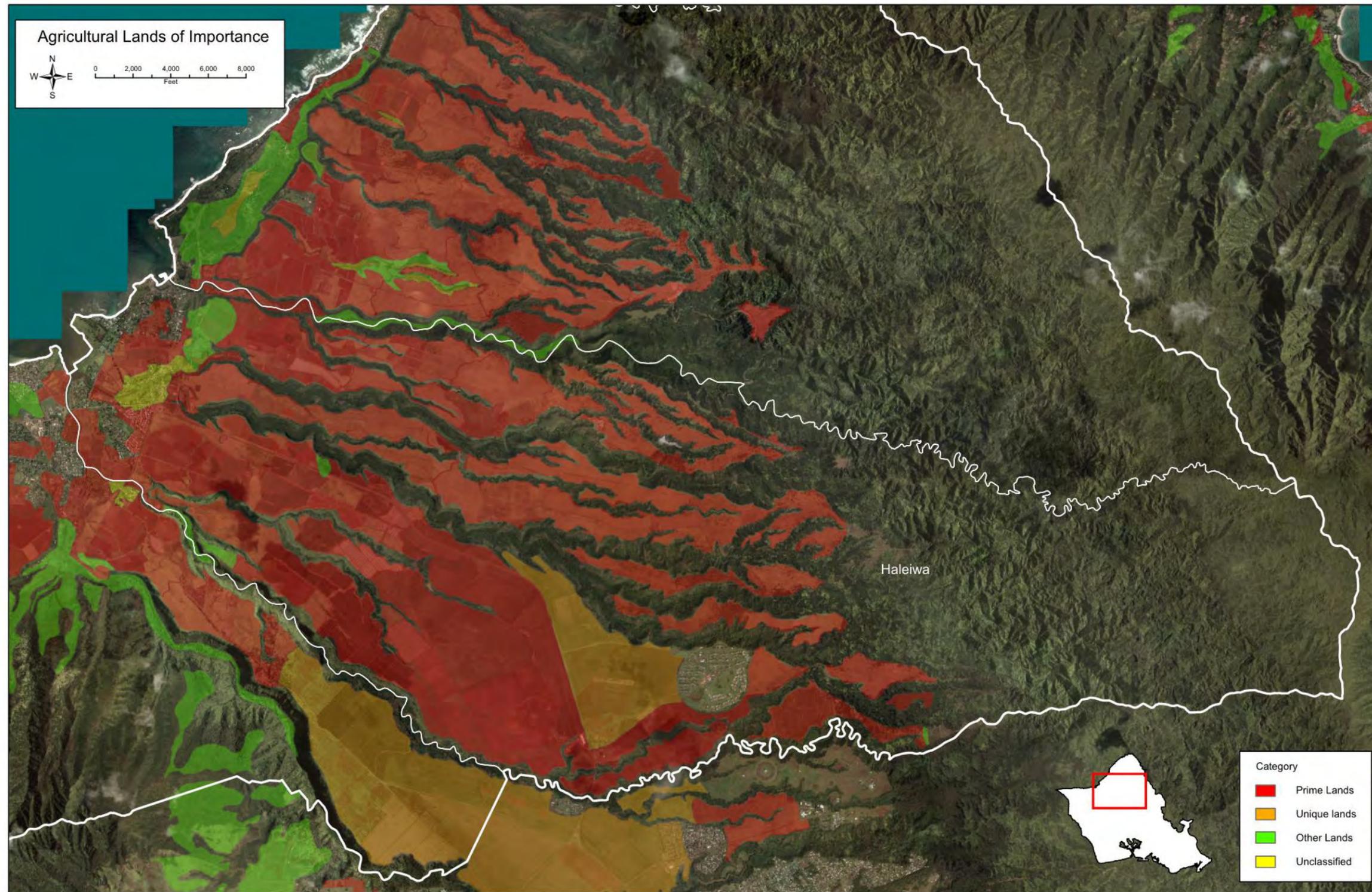


Figure B-2.8. Agricultural Lands of Importance – Haleiwa

Source: Hawaii Statewide GIS Program

Table B-2.1. Characteristics of Soils in the North Shore Region

Source: U.S. Dept. of Agriculture (1972: Guide to Mapping Units & Table 3)		Capability		
Map Symbol	Mapping Unit	Irri- gated	Non Irri- gated	<u>Classification</u> Degree and kind of limitations for septic tank filter fields
CR	Coral outcrop	–	-VIIIs	n.a.
EaB	Ewa silty clay loam, 3-6%	Ile	IVc	Slight: moderate permeability; severe where soil is moderately shallow
EaC	Ewa silty clay loam, 6-12%	IIIe	IVe	
EmA	Ewa silty clay loam, mod. shallow, 0-2% slopes	IIs	IVs	
EwC	Ewa stony silty clay, 6-12% slopes	IIIe	IVe	Slight: moderate permeability
Fd	Fill land	–	–	n.a.
FL	Fill land, mixed	–	–	n.a.
HeA	Hale'iwa silty clay, 0-2% slopes	Ile	IIIc	Slight: except where subject to local flooding
HLMG	Helemano silty clay 30-90%	–	VIIe	Sever on slopes of 30-90%
JaC	Jaucus sand, 0-15% slopes	IVs	VIe	Slight: rapid permeability
KaB	Ka'ena clay, 2-6% slopes	IIIw	IVw	
KaeB	Ka'ena stony clay, 2-6% slopes	IIIw	IVW	Severe: slow permeability; seepage
KaeC	Ka'ena stony clay, 6-12% slopes	IIIw	IVw	
KanE	Ka'ena very stony clay loam, 10-35% slopes	–	VIw	
KeA	Kawaihapai clay loam, 0-2% slopes	I	IIC	Slight
KIB	Kawaihapai clay loam, 2-6% slopes	Ile	Ile	Slight
KIaA	Kawaihapai stony clay 0-2% slopes	IIs	IIs	Slight
KIaB	Kawaihapai stony clay 2-6% slopes	Ile	Ile	Slight
KIbC	Kawaihapai very stony clay loam, 0-15% slopes	–	VIIs	Slight to moderate, depending on slope

Table B-2.1. Characteristics of Soils in the North Shore Region
(Continued)

KmA	Kea'au clay, 0-2% slopes	IIIw	Vw	Severe: slow permeability; high water table
KmbA	Kea'au clay, saline 0-2% slopes	—	VIw	
KpF	Kemo'o silty clay, 35-70% slopes	—	VIIe	Severe due to slope
LaB	Lahaina silty clay, 3-7% slopes	IIe	IIIc	Slight
LaC	Lahaina silty clay, 7-15% slopes	IIIe	IIIe	Moderate, due to slope
LaC3	Lahaina silty clay, 7-15% slopes, severely eroded	IVe	IVe	Moderate, due to slope
Mnc	Mamala stony silty clay loam, 0-12% slopes	III _s	IV _s	Severe: coral at a depth of less than 20 inches
Ms	Mokule'ia loam	II _s	VI _s	Slight: rapid permeability below a depth of 20 inches
Mt	Mokule'ia clay loam	II _s	VI _s	
Mz	Marsh	—	VIIIw	n.a.
Ph	Pearl Harbor clay	TVw	TVw	Severe: ponds graded, slow
PsA	Pulehu clay loam, 0-3% slopes	I IIe	IVc IV _s	Slight on slopes of 0-7%; moderate in low areas subject to occasional flooding
PuB	Pulehu stony loam, 2-6% slopes			
rSY	Stony steep land	—	VII _s	n.a.
rRK	Rock land	—	VII _s	n.a.
TR	Tropaquepts	IVw	IVw	Severe: high water table
WaB	Wahiawa silty clay, 3-8% slopes	IIe	IIe	Slight
WaD2	Wahiawa silty, clay 15-25% slopes, eroded	—	IVe	Severe, due to slope
WkA	Waialua silty clay, 3-8% slopes	I	IIIc	Slight on slopes of 0-8%; moderate permeability
WIB	Waialua stony silty clay, 3-8% slopes	IIIe	III _s	
WzA	Waipahu silty clay, 0-2% slopes	I	IVc	Severe: moderately slow permeability

Appendix B-3: Groundwater

Appendix B-3

Groundwater

A U.S. Geological Survey (USGS) study in 1971 identified six major groundwater compartments in the North Shore region. They are high level dike water impounded in the upper reaches of the Koolau and Waianae Mountain Ranges, mid-level water beneath the Schofield plateau, and basal water in the Mokuleia, Waialua-Haleiwa, and Kawaihoa areas, respectively (Hydro Resources, 1996). The Hawaii Department of Land and Natural Resources, Commission on Water Resource Management (CWRM) assigns hydrologic units to group groundwater resources on each island. The hydrologic units are defined first by Aquifer Sector Areas which reflect broad hydrogeological similarities while maintaining hydrographic, topographic and historical boundaries where possible. Aquifer Sector Areas may then be further divided into Aquifer System Areas which are smaller subregions based on hydraulic continuity and related characteristics (Hawaii Water Resource Protection Plan, CWRM 2008). Figure B-3.1 contains the hydrologic unit map for the island of Oahu. Groundwater in the North Shore region study area is represented by the North aquifer system and partially by the Central aquifer system.

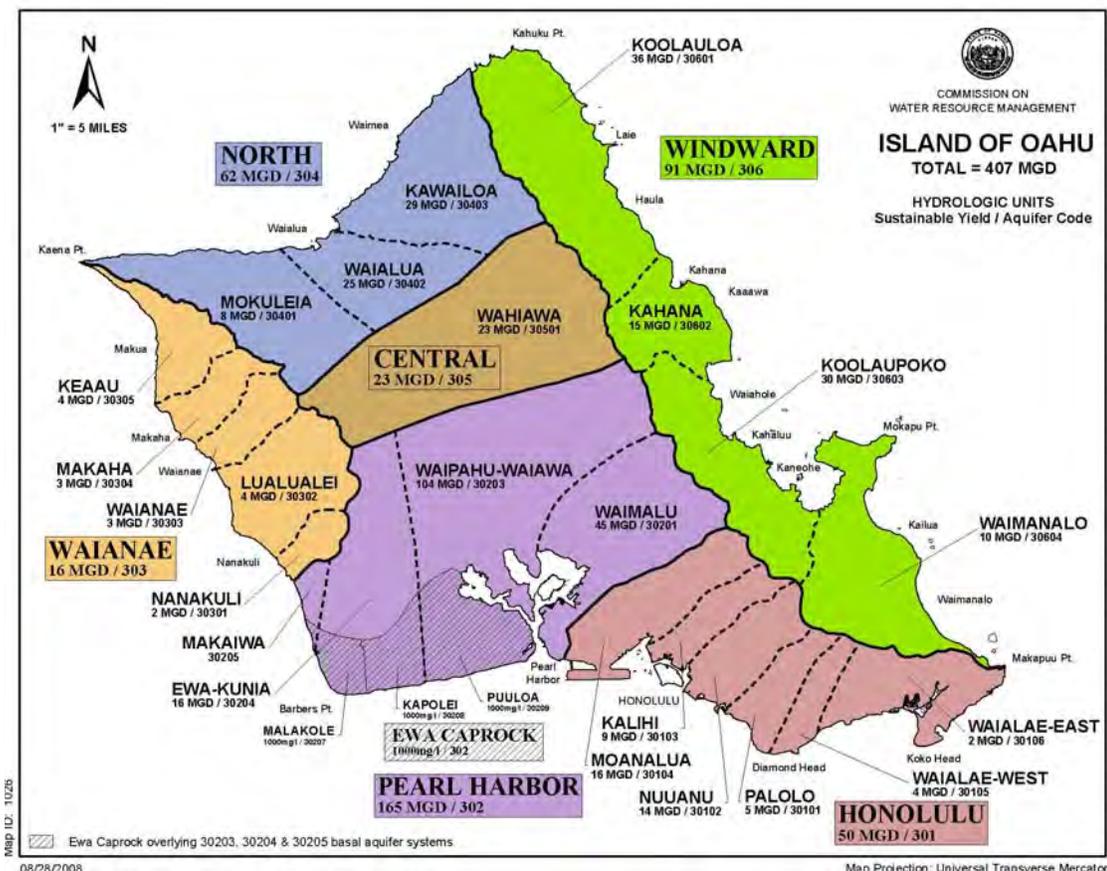


Figure B-3.1. Oahu Groundwater Hydrologic Units

Source: Hawaii Dept. of Land and Natural Resources, Commission on Water Resource Management, 2008

Most of Oahu, including the North Shore region, is classified as a Water Management Area by CWRM. The Commission has the authority to impose a Water Management Area (WMA) designation on areas where water resources are deemed critical and especially sensitive to current and future withdrawals (Sec 174C-41, HRS). With this designation come specific requirements for owners of groundwater wells and stream diversions drawing water from WMA sources. Owners of existing or proposed wells in a WMA must obtain an approved water use permit from CWRM. Water use permits contain the conditions that users must meet in order to withdraw water from a WMA. Its purpose is to allow for the maximum reasonable beneficial use of water resources while ensuring that the integrity of the resource is not threatened.

The sustainable yield for the North aquifer sector is 62 MGD, and for the Central aquifer sector is 23 MGD. The latest published data of groundwater withdrawals in the North and Central sectors are found in the 2008 Water Resource Protection Plan developed by CWRM for the year 2005. Table B-3.1 contains the aquifer withdrawals at the aquifer system level.

Table B-3.1. Groundwater Withdrawals in the North Shore Region						
Aquifer Sector	Aquifer System	Sustainable Yield (SY) (MGD)	Existing Permit Allocations (MGD)	Unallocated SY (MGD)	Existing Water Use (MGD) 12MAV July 2005	SY minus pumpage (MGD)
Central	Wahiawa	23	20.386	2.614	9.245	13.755
North	Mokuleia	12	8.301	3.699	0.401	11.599
	Waialua	40	30.311	9.689	3.106	36.894
	Kawailoa	39	1.549	37.451	0.682	38.318
Total		114	60.547	53.453	13.434	100.566

Source: 2008 Water Resource Protection Plan, CWRM, 2008

It is important to note that existing water use values are significantly lower than the existing permit allocations for each system. One reason for this difference is that a portion of the unused allocation accounts for future water demand. Another more significant reason is that much of the permit allocation was made for agricultural practices which have declined greatly since the close of the sugar plantation. The Commission on Water Resource Management is in the process of reviewing its permit allocations and may revoke or amend those permits that have extended periods of little to no water use.

Appendix B-4: Surface Water

Appendix B-4

Surface Water

The major streams of the North Shore region historically have been an important source of irrigation for agriculture, especially during the years of sugar production. Currently, these streams still provide water for various agricultural practices throughout the region, albeit at a level not nearly as high as the sugar production years. Table 2-4.1 lists various locations that are monitored by the USGS for stream flow.

Table B-4.1. Historic Stream Discharge Flows for Various Streams

Station Number	Period of Record	Name of Station	Drainage Altitude (ft)	Area (mi ²)	Average Discharge (cfs)	Peak Discharge (cfs)	Date	Minimum Discharge (cfs)
16-2000	1916-2009	N. Fork Kaukonahua Steam Above Right Branch	1150	1.38	15.9	6290	12/11/08	0.12
16-2080	1957-2009	S. Fork Kaukonahua Stream At East Pump Reservoir	860	4.1	20.6	6070	12/11/08	0
16-2105	1963-2010	Kaukonahua Stream at Waialua	15	39.26	n/a	15600	4/15/63	n/a
16-2112	1967-2003	Poamoho Stream at Waialua	22	12.7	n/a	7340	4/19/74	n/a
16-2113	1958-2010	Makaleha Stream at Waialua	190	4.18	n/a	3640	11/13/66	n/a
16-3178	1980-2003	Kaunala Gulch near Sunset	n/a	1.98	n/a	250	3/18/80	n/a
16-3180	1968-2004	Paumalu Gulch at Sunset	n/a	2.59	n/a	982	4/19/74	n/a
16-3250	1964-2001	Kamananui Stream near Pupukea Military Road	590	3.15	9.8	3390	1/30/75	0
16-3300	1958-2009	Kamananui Stream at Maunawai	20	12.36	17.9	16800	11/20/90	0
16-3310	1968-2009	Waimea Gulch near Kawailoa Camp	n/a	2.19	n/a	2030	3/18/80	n/a
16-3400	1958-2003	Anahulu River near Haleiwa	70	13.87	n/a	15900	4/19/74	n/a
16-3430	1968-1982	Helemano Stream at Haleiwa	1.57	14.44	11.6	18200	4/19/74	n/a
16-3450	1960-2009	Opaeula Stream near Wahiawa	1120	3.01	13.4	5540	7/17/74	0
16-3500	1956-2004	Opaeula Stream near Haleiwa	18	5.89	n/a	7600	4/19/74	n/a

Kaukonahua Stream and Wahiawa Reservoir

Though most of the major streams of the North Shore region supply irrigation to various agricultural practices, Kaukonahua Stream has historically been the most widely utilized. With a length of about 30 miles, Kaukonahua Stream is the longest stream on Oahu. Its drainage area is approximately 40 square miles. Wahiawa Dam and Wahiawa Reservoir, also known as Lake Wilson, were constructed on Kaukonahua Stream in 1906 to serve the irrigation needs of the Waialua Sugar Company. This reservoir is the second largest in the state with a maximum storage capacity of 9,200 acre-feet and a surface area of approximately 300 acres. Since the closing of the sugar plantation in 1996, only small private farms remain that utilize irrigation water from Wahiawa Reservoir. The large decrease in irrigation demand caused the reservoir water level to approach the dam spillway elevation, posing a flood risk to Waialua residents downstream of the dam. In 2004 the State Department of Land and Natural Resources (DLNR) began lowering the reservoir level to create a larger storage capacity for flood protection.

An existing diversion channel near the dam currently sends reservoir water to the small farms downstream. Calls to the CWRM, which falls under DLNR, determined that there is no current flow monitoring program to track irrigation withdrawals from Wahiawa Reservoir, nor are there any maximum withdrawal limits imposed on registrants who apply for stream diversion permits. However, a program is currently being developed that will assess all permitted stream diversions statewide and determine the amount of water that is being used for irrigation. A draft of the Oahu Water Management Plan being developed by BWS suggested a minimum and maximum potential non-potable water supply of 8.5 mgd and 22 mgd, respectively, from Kaukonahua Stream.

Appendix B-5: Coastal Water

Appendix B-5

Coastal Water

Coastal resources play a vital role in the culture and economy of the North Shore region, and the State of Hawaii in general. Local and State regulatory programs are in place to protect near-shore ocean resources from contamination. Several broad classifications of open water and bottom types exist offshore of the project area. The most specific of these classifications are from DOH Title 11, Chapter 54 – Water Quality Standards. Under these rules, all marine waters are classified as being either embayments, open coastal, or oceanic waters. Water quality criteria and an accompanying level of appropriate protection are specified for each designation. These designations are either Class AA or Class A. Class AA waters are the most highly protected and are to be managed so that the wilderness character of these areas are protected “...with an absolute minimum of pollution or alteration of water quality from any human caused source or actions.” Class A waters are primarily managed for recreational and aesthetic purposes although other uses are permitted so long as they are compatible with propagation of wildlife and recreation. Further, “These waters shall not act as receiving waters for any discharge that has not received the best degree of treatment or control compatible with the criteria established for this class.”

Bottom subtypes are: sand beaches, lava rock shoreline and solution benches, marine pools and protected coves, artificial basins, reef flats and reef communities, and soft bottom communities. These marine bottom ecosystems are likewise given two levels of protection, Class I and Class II. Class I marine bottom ecosystems are most highly protected and are to be managed in their natural state “...with an absolute minimum of pollution from any human-induced source.” Class II marine bottom types are to be managed for the propagation of marine life and for recreation. Additionally, “Any action that may permanently or completely modify, alter, consume or degrade marine bottoms...” requires written approval of the Director of Health.

Additional classifications are mandated by the Federal Water Pollution Control Act [Section 303(e) – Basin Planning] as reported in the 208 Plan. These regulations identify two marine water types in the region; Water Quality Limited Segments and Effluent Limitation Segments. Water Quality Limited Segments are those coastal areas that are identified by DOH that generally do not meet water quality standards and will likely not meet applicable standards even after effluent limitations on point source discharges are in place. Effluent Limitation Segments are the coastal areas where water quality standards are generally being met or where applicable standards will likely be met after effluent standards are in place.

Under the state classification scheme, all waters seaward of the 100 fathom line are designated oceanic waters and are considered Class A waters. The ocean area inside the 100 fathom line from the tip of Kaena Pt. to a distance of 3.5 miles on both the southeast (Makua) and northeast (Mokuleia) directions are designated Class AA open coastal waters, as is the reach from Kaiaka Pt. to Puaena Pt. (outside of Kaiaka Bay). All other coastal areas in the project area are Class A. Kaiaka Bay and Haleiwa Boat Harbor are considered Class A embayments and Waialua Bay (exclusive of the boat harbor) is considered a Class AA embayment.

Bottom communities associated with Kaena Pt. Natural Area Reserve and Sharks Cove (Pupukea) Marine Life Conservation District are Class I bottom areas. These areas are lava rock shore line and solution benches. Waimea Bay is designated as a Class I wave exposed reef community. The Mokuleia region has both solution bench and marine pool areas designated as Class H. Waialua Bay, Haleiwa Boat Harbor, and Kaiaka Bay are Class II bottom areas.

The City and County 208 Plan identifies the waters within Waialua and Kaiaka Bays as a Water Quality Limited Segment. This reach (designated Hydrographic Area VI), was determined to be a medium use area amenable to water quality improvements. The watershed area draining into of Kaiaka Bay encompasses approximately 80 mi². Dale (1976) estimated an infusion of freshwater of 7.05 mgd via caprock leakage from the aquifer. Waialua Bay receives surface water from the Anahulu River which has a watershed of about 16 mi². An inflow of about 4.79 mgd of freshwater flows through the caprock and into the bay. The remainder of the coastal areas, to the southeast towards Kaena Pt. and to the northwest towards Kawela Bay, are designated Effluent Limitation Areas in the 208 Plan.

The Hawaii Coastal Zone Management (CZM) Program is a broad management framework incorporating regulatory authorities of state and county agencies to provide greater coordination of existing laws. County governments play a crucial role in implementing the Hawaii CZM Program by regulating development in geographically designated Special Management Areas (SMA). Through their respective SMA permit systems, the Counties assess and regulate development proposals in the SMA for compliance with the CZM objectives and policies and SMA guidelines set forth in Chapter 205A, Hawaii Revised Statutes (HRS).

Appendix B-6: Threatened and Endangered Plants & Critical Habitats

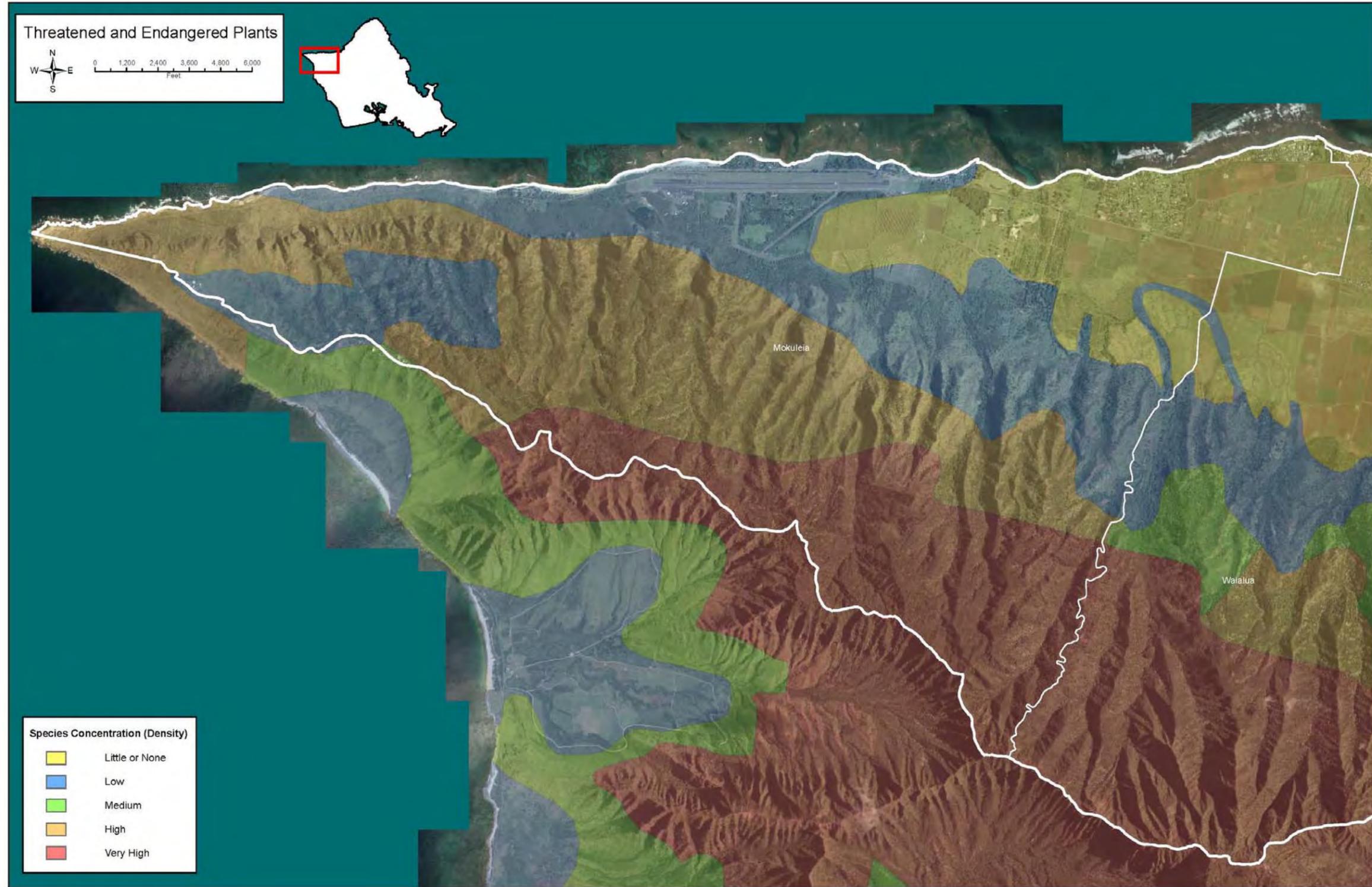


Figure B-6.1. Threatened and Endangered Plants Densities in the Mokuleia Subdistrict

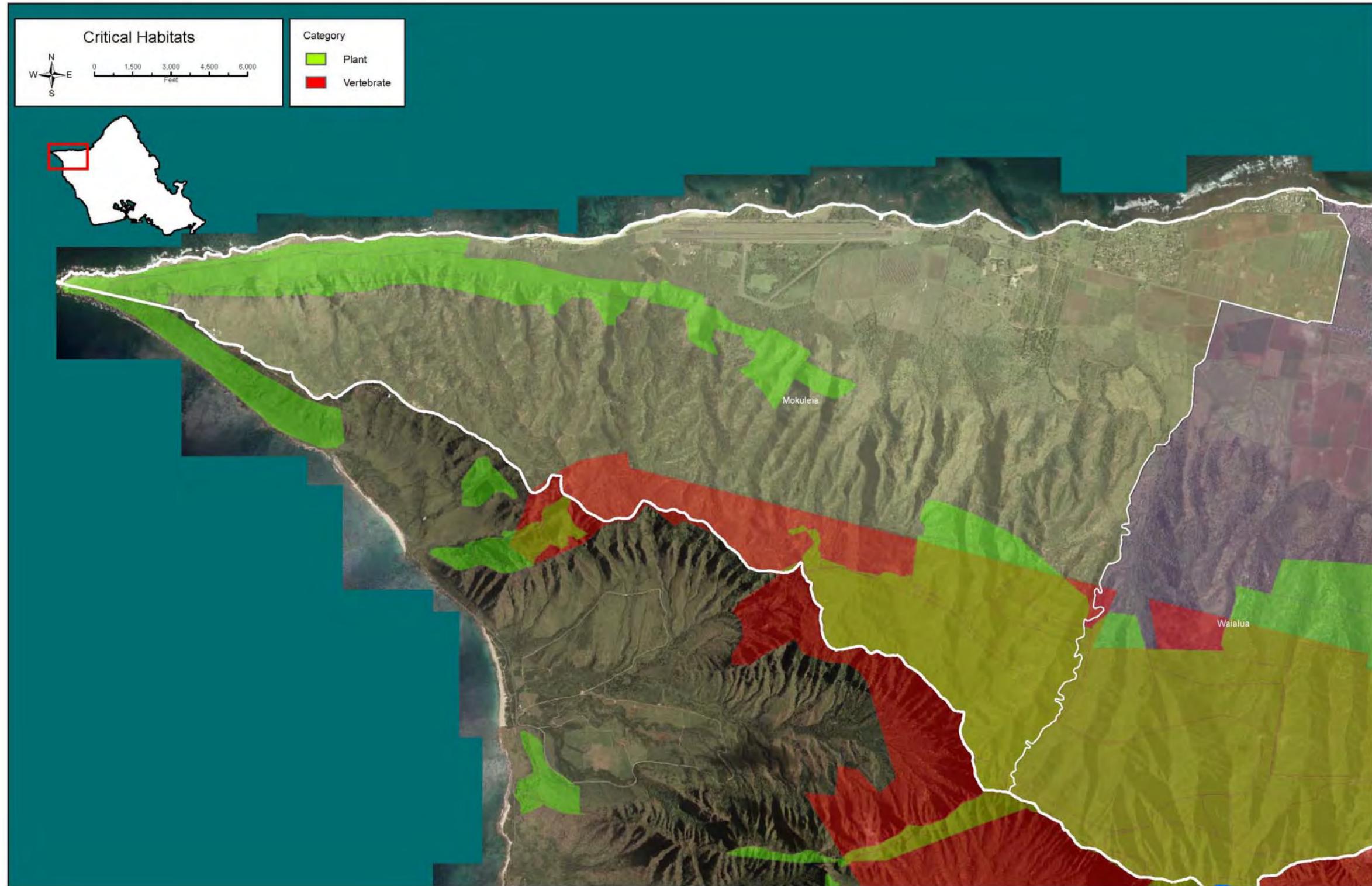


Figure B-6.2. Critical Habitat Locations in the Mokuleia Subdistrict

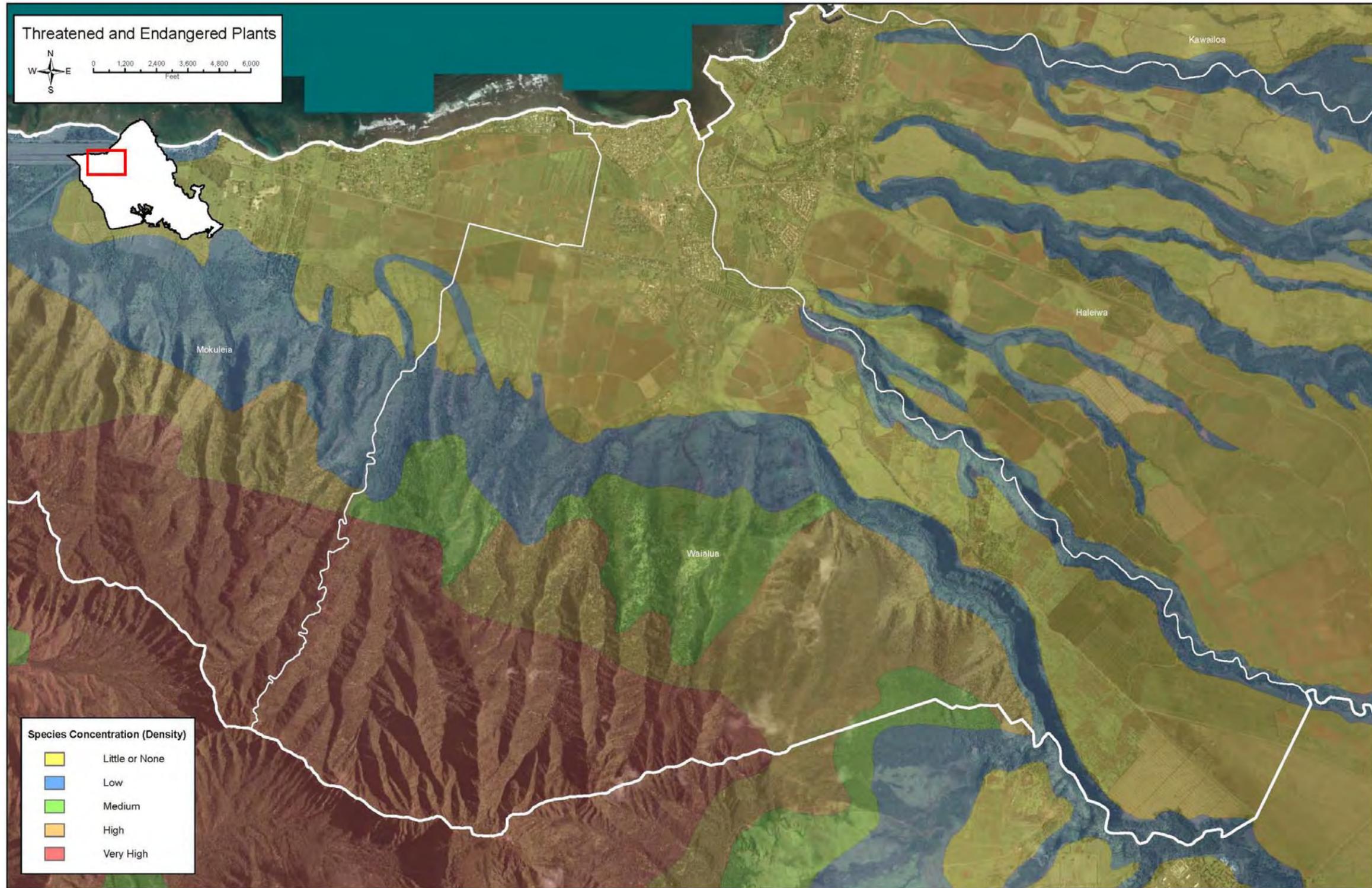


Figure B-6.3. Threatened and Endangered Plants Densities in the Waialua Subdistrict

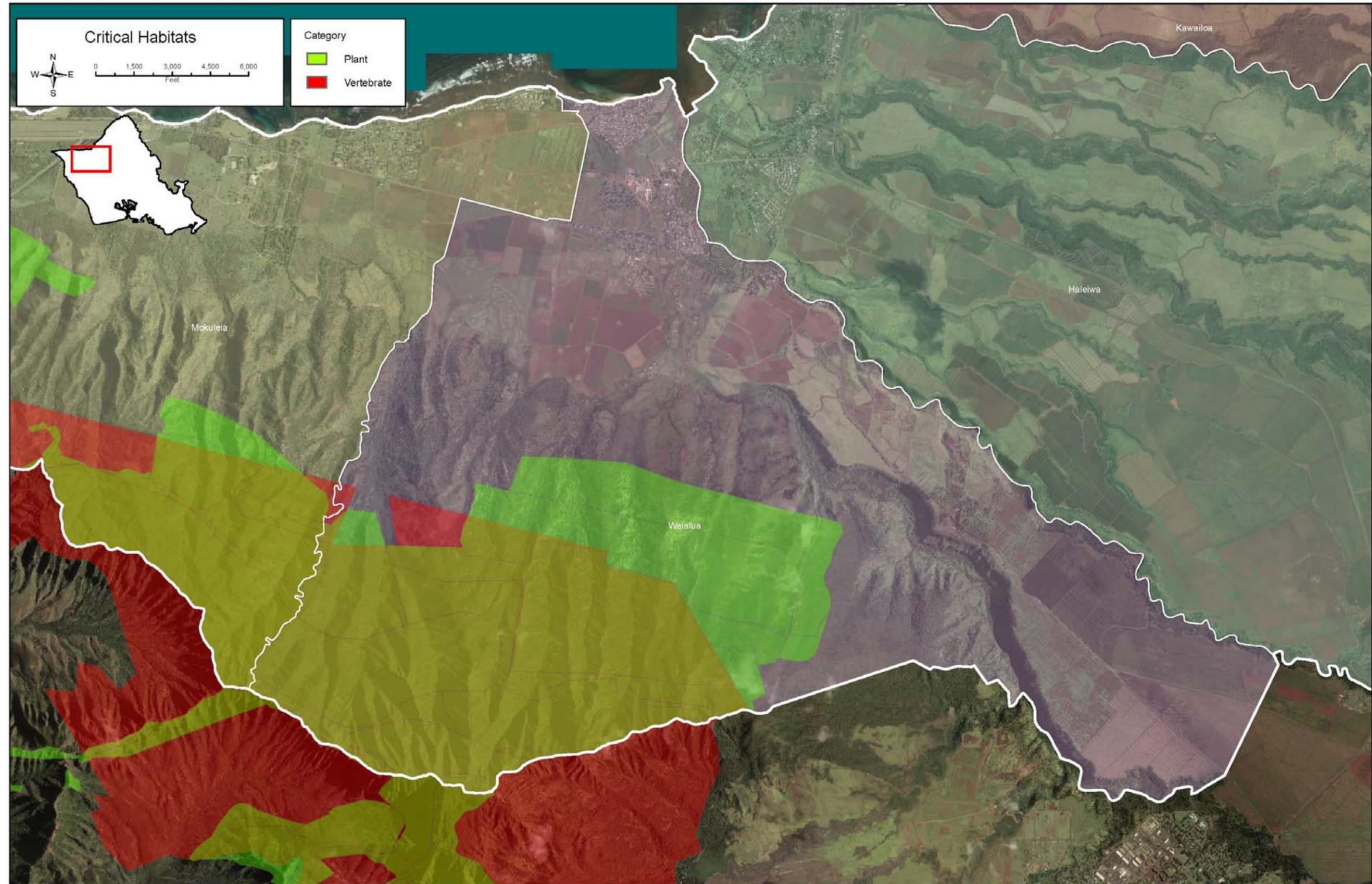


Figure B-6.4. Critical Habitat Locations in the Waialua Subdistrict



Figure B-6.5. Threatened and Endangered Plants Densities in the Haleiwa Subdistrict

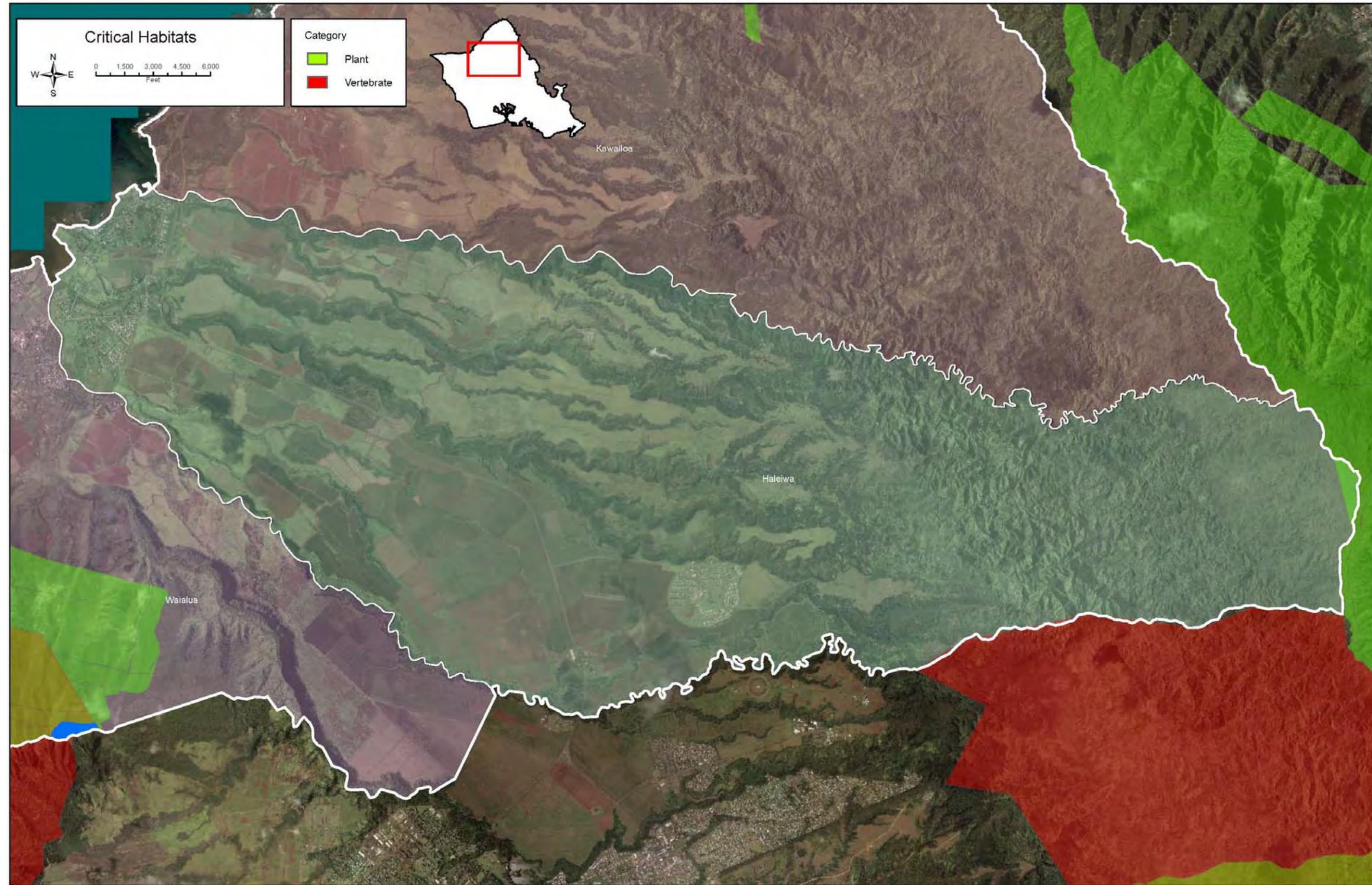


Figure B-6.6. Critical Habitat Locations in the Haleiwa Subdistrict

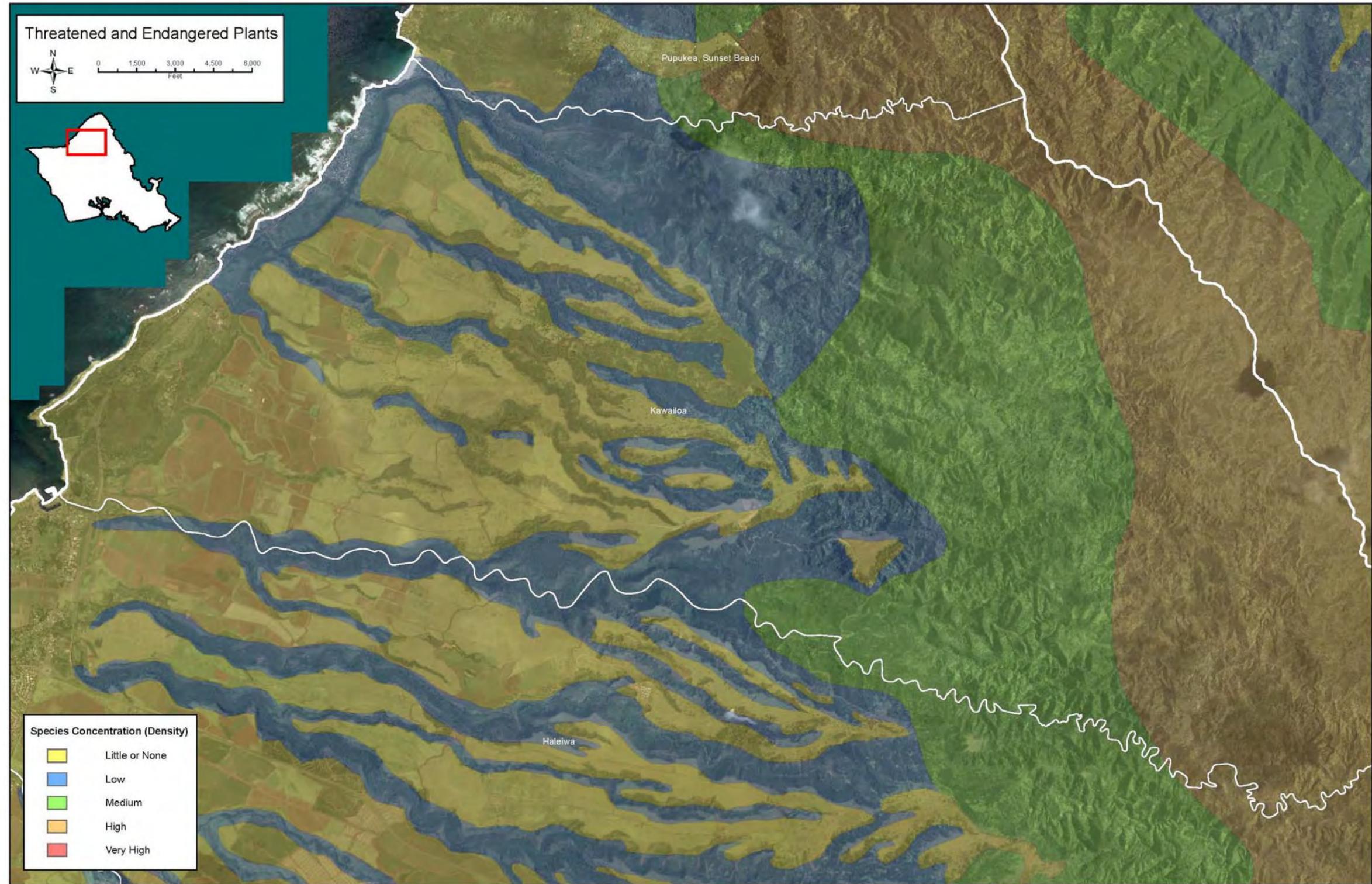


Figure B-6.7. Threatened and Endangered Plants Densities in the Kawaiiloa Subdistrict

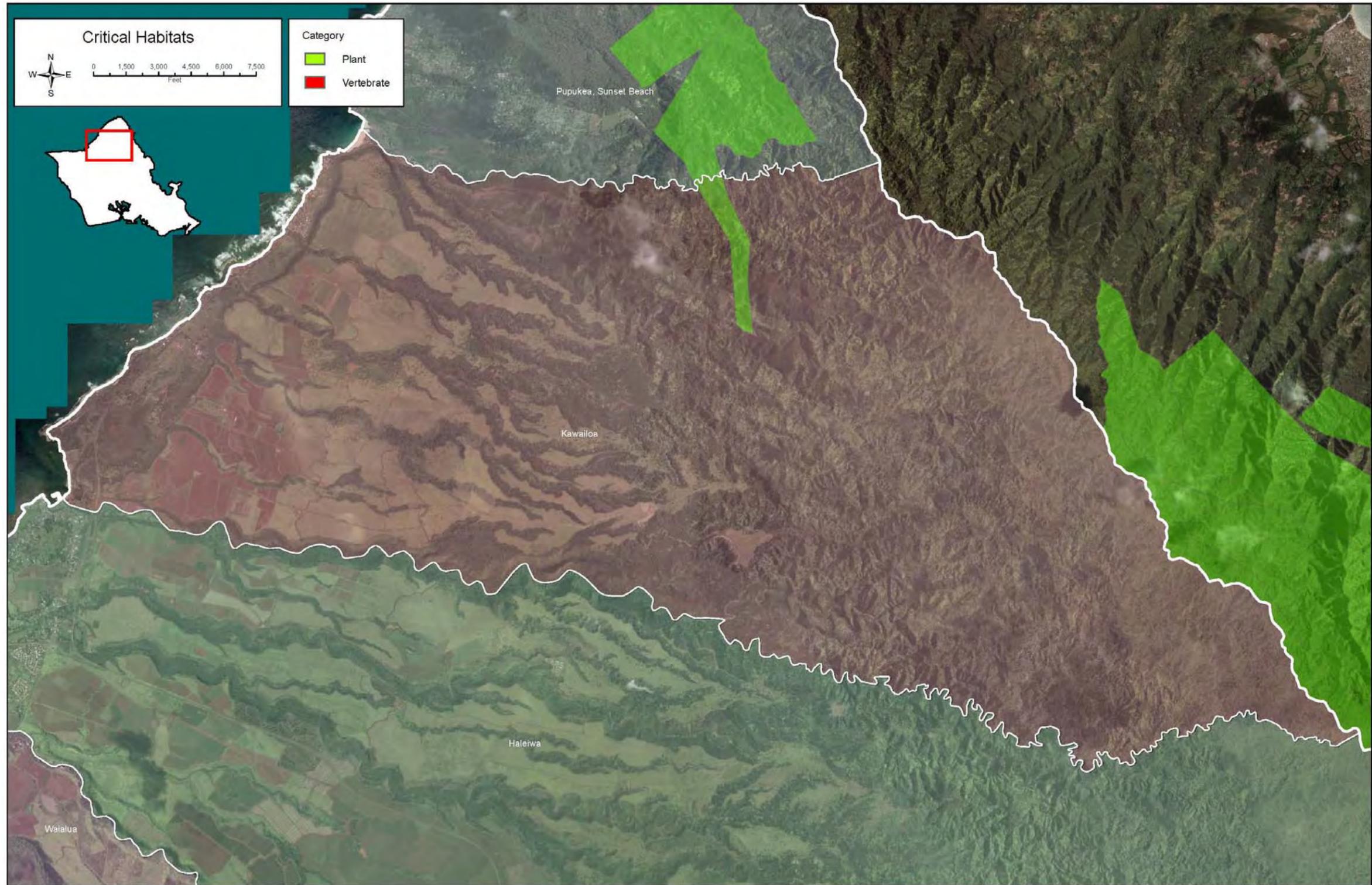


Figure B-6.8. Critical Habitat Locations in the Kawaiiloa Subdistrict



Figure B-6.9. Threatened and Endangered Plants Densities in the Pupukea/Sunset Beach Subdistrict

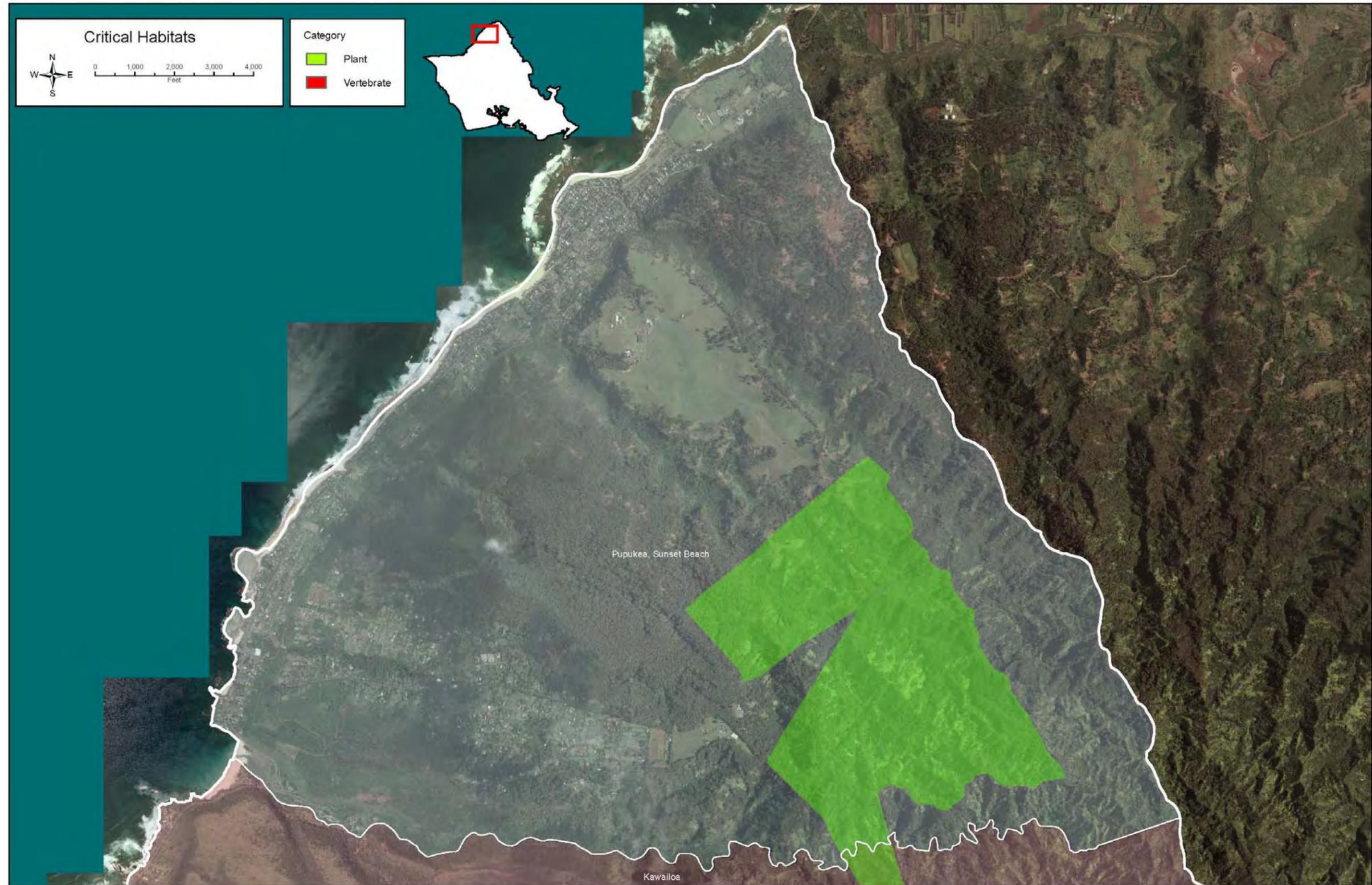


Figure B-6.10. Critical Habitat Locations in the Pupukea/Sunset Beach Subdistrict

Appendix B-7: Air Quality and Noise

Appendix B-7

Air Quality and Noise

Air Quality

Since the Waialua-Haleiwa District is largely a rural area of low population density, there are few air pollution sources. In addition to these sources, it is noted that high surf periods produce high amounts of salt mist that may be corrosive to many metals.

In the past, the Waialua Sugar Mill has been cited by federal officials for violation of visible emissions (opacity) standards (U.S. Environmental Protection Agency, 11 July 1979). However, its closure in 1996 eliminated this source of air quality violation.

The 2008 Hawaii Air Quality Data Annual Summary was reviewed for this report, and no sites in the North Shore region were found to be part of the study. Although the DOH does not maintain a permanent air monitoring station in the area, and there are no monitoring data available, it seems reasonable to assume that existing air quality is generally quite good due to the relatively low level of development and man's activities. In the air quality impact analysis done for the Haleiwa Bypass highway project (U.S. Department of Transportation, April 1980), the maximum carbon monoxide concentration predicted along Kamehameha Highway for existing traffic levels was 30.7 milligrams per cubic meter, thus exceeding the State's one-hour standard but meeting the Federal standard (See Figure B-7.1). Future levels were predicted to meet State standards due to Federal emission controls on new motor vehicles. Officially, the Waialua District is "considered an attainment area with respect to both federal and state ambient air quality standards" (Morrow; June 1982:4).

Air Pollutant	Averaging Time	Standards		
		Hawaii State Standard	Federal Primary Standard ^a	Federal Secondary Standard ^b
Carbon Monoxide	1-hour	9 ppm	35 ppm	None
	8-hour	4.4 ppm	9 ppm	
Nitrogen Dioxide	Annual	0.04 ppm	0.053 ppm	Same as primary
PM ₁₀	24-hour	150 µg/m ³	150 µg/m ³	Same as primary
	Annual ^c	50 µg/m ³	None	
PM _{2.5}	24-hour		35 µg/m ³	Same as primary
	Annual		15 µg/m ³	
Ozone	8-hour ^d	0.08 ppm	0.075 ppm	Same as primary
Sulfur Dioxide	3-hour	0.5 ppm	0.14 ppm	0.5 ppm
	24-hour	0.14 ppm		
	Annual	0.03 ppm		
Lead ^e	Calendar Quarter	1.5 µg/m ³	0.15 µg/m ³	Same as primary
Hydrogen Sulfide	1-hour	0.025 ppm	None	None

^a *Primary Standards* set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children and the elderly.

^b *Secondary Standards* set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

^c Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM₁₀ standard effective December 17, 2006. However, the state still has an annual standard.

^d Effective May 27, 2008.

^e Due to almost non-detectable levels, ambient air monitoring for lead was discontinued in October 1997 with EPA approval. However, since 2003 lead continues to be measured as part of the Air Toxics monitoring program. Revised federal lead standard effective October 15, 2008.

Figure B-7.1. State and Federal Ambient Air Quality Standards

Source: State Standards HAR 11-59; Federal Standards 40 CFR Part 50

Noise

Existing noise levels within the Waialua District vary widely with the time of day and distance from natural and human noise sources (Darby-Ebiisu & Associates, Inc., April 29, 1982). Background ambient noise levels are controlled by natural sources such as surf, wind-blown leaves, crickets, and birds. When these are present, *minimum* noise levels will generally range from 38 to 45 dB. Areas which are adjacent to vacant brush or to cultivated fields of maturing sugarcane can experience higher background ambient levels of 50 to 60 dB, particularly during the first two hours following sunset. These natural noise sources provide a nearly continuous masking effect over other distant sounds during the night. They can also exceed state and local noise limits, particularly during the nighttime hours.

Noise sources associated with human activity, such as motor vehicles and aircraft, are generally louder than the natural sources and generate intermittent noise levels of 70 to 96 dB. However, because of their intermittent nature (particularly at night), they do not provide a reliable source for masking (or making inaudible) the natural noise sources, which are always present in one or more forms.

The existing L_{dn} noise levels probably range from 55 dB to 70 dB, depending upon distance of a particular location from major streets. Locations immediately fronting major streets such as Kamehameha and Farrington Highways, Waialua Beach Road, Goodale Avenue, and Haleiwa Road probably experience L_{dn} values of 65 to 70 dB. Locations which are shielded or remote (in excess of 200 feet) from these major streets probably experience L_{dn} levels of 55 to 60 dB.

Appendix B-8: Historic Sites

Appendix B-8

Historic Sites

Table B-8.1. North Shore Registered Historic Sites			
Site Name	Tax Map Key	Hawai'i Register Date	National Register Date
Kupopolo Heiau	6-1-005:016	9/5/1978	6/4/1973
Ka'ena Complex	6-9-002:006,009	6/9/1988	
Pohaku Lanai	6-6-007:007	11/26/1986	
Waialua Courthouse	6-6-009:023	2/20/1979	
Kawailoa Ryusenji Temple (demolished)	6-1-005:001		11/21/1978
Waialua School (Haleiwa)	6-6-013:012	5/3/1980	8/11/1980
Kealii O Ka Malu Church	6-6-008:017	8/26/2000	
Waialua Fire Station	6-6-013:003	7/19/1980	12/2/1980
Haleiwa Beach Park	6-2-001:002	6/9/1988	

Source: 2009 National and State Register of Historic Places, Historic Preservation Division, Hawaii Department of Land and Natural Resources

Appendix B-9: Population & Socioeconomic Conditions

Appendix B-9

Population and Socioeconomic Conditions

Current Estimated Population

Table B-9.1 shows the 2005 population estimates and household breakdown by subdistrict for the North Shore region. The combined 2005 estimated regional population is 18,421 persons with an estimated 6,191 total housing units. Chapter 4 will discuss future growth projections and will describe how overall population is estimated to decrease over the course of the study period as an ongoing result of sugar operations closing in 1996.

Employment Landscape

The 1990's saw a drastic reduction in agricultural jobs throughout the state as a result of plantations closing on every major island. According to the 2000 Census, the agricultural industry lost 28% of workers during that decade, with Oahu losing the largest number at 2,042 workers (Honolulu Advertiser – May 15, 2002). It should be noted that at the time of this report, the 2010 census had been completed but data was not yet available. With the closing of Waialua Sugar Company, the foundation of the North Shore's economy has centered on the Services and Retail sector, which make up about 66% of total employment in the region (See Table B-9.2). These sectors rely heavily on tourism, as over 4 million visitors travel to Oahu every year and contribute well over \$5 billion to the local economy. (Hawaii Dept. of Business, Economic Development & Tourism – 2010 Monthly Visitor Statistics).

Socioeconomic Characteristics

According to Table B-9.4, the median household income for the North Shore region in 2000 was \$45,000 compared to the island of Oahu's median household income of \$52,280. Almost 25% of households brought in less than \$25,000 annually, and 10.6% of families were considered living at or below the poverty level.

Regarding the ethnic breakdown of the region, the closing of the sugar plantation saw a decrease in the Asian and Pacific Islander populations and an increase in the Caucasian and African American populations.

Existing Land Use Pattern

Mokuleia

The Mokuleia area includes very few residential areas. Developed lands within this area are primarily utilized for agricultural purposes or recreational purposes including the Mokuleia Polo Field, Dillingham Airfield and Kaena State Park. There are also two well-known camps in the area at YMCA Camp Erdman and the Episcopal Church's Camp Mokuleia.

Waialua

The present land use pattern in the Waialua area has been one of transition since the closing of the sugar mill in 1996. The former sugar mill site owned by Castle & Cooke and the adjacent town center owned by the Gilman Trust still remain as the focal point for the town of Waialua. The former sugar mill site is now home to the community Farmer's Market, the Waialua Bandstand, and a number of businesses that operate in some of the mill's renovated buildings. The majority of residential units lie within a half-mile of the mill site.

Portions of designated agricultural lands in Waialua are utilized by diversified agriculture. Pioneer Hi-bred International has been acquiring acreage in Waialua for its seed products, mainly corn and sunflowers. They also produce soybeans for products like tofu. Property records show that Pioneer owns at least 1,000 acres in Waialua. Other small farm companies own parcels throughout the subdistrict or lease land from Dole Foods, which is the largest private land owner in this subdistrict. The Galbraith Trust, which originally owned about 2,100 acres of agricultural land toward the southeastern portion of the subdistrict, has been trying to sell all of its holdings since the trust expired in 2007. There have been attempts by private investors to purchase the land with the intent of developing it into 5-acre parcels, similar to that of the Poamoho Estates on Kaukonahua Road. However, these attempts have not come to fruition, and although a few parcels have sold, the majority of the property still remains undeveloped and fallow.

Haleiwa

The town of Haleiwa is physically separated from Waialua by the flood plain of Kiiikii Stream. The westernmost portions of the town, as well as the area adjacent to Paukauila Stream, consist mostly of relatively large parcels containing from one to six houses. A number of active farms are present, Commercial development is strung along Kamehameha Highway between Weed Circle and the Anahulu River. These stores cater to both tourists and local residents of the entire North Shore area as well.

Residential development in Haleiwa is split into a number of clusters. The three oldest consist of the houses along Haleiwa Road and Kamehameha Highway north of Achiu Lane, the homes north and west of Weed Circle near Paukauila Stream, and the houses along Kaamooloa Road. The 307-unit Paalaa Kai Subdivision developed between the latter two areas greatly increased the number of residential units in Haleiwa.

Table B-9.1. Estimated 2005 Population and Household Statistics for the North Shore Region

Subdistrict	Total Resident Population	Population in Group Quarters	Visitor Accommodations Units	Resident Housing Units	Households						
					1 Person	2 Persons	3 Persons	4 Persons	5+ Persons	Total	Average Size
Mokuleia	2350	152	5	1077	359	357	167	81	49	1013	2.17
Waialua	3393	25	0	1081	151	272	207	181	218	1028	3.28
Haleiwa	4376	51	0	1374	199	321	241	215	311	1288	3.36
Kawailoa	3939	160	1	1390	250	393	253	197	196	1289	2.93
Sunset Beach/Pupukea	4363	12	11	1726	340	512	301	226	194	1573	2.77
Total	18421	400	17	6648	1299	1855	1169	900	968	6191	

Table B-9.2 Estimated 2005 Employment Statistics for the North Shore Region

Subdistrict	Employment (jobs)										
	Armed Forces	Public Admin	Hotel	Agriculture	Transp, Comm, Utilities	Industrial	Fin, Ins, & Real Estate	Services	Retail	Constr	Total
Mokuleia	1	0	3	75	11	23	11	255	37	0	416
Waialua	0	0	0	104	6	35	24	205	50	0	424
Haleiwa	0	42	0	199	53	187	78	490	771	0	1820
Kawailoa	125	9	0	41	4	26	6	96	57	0	364
Sunset Beach/Pupukea	0	11	5	30	67	101	36	418	216	0	884
Total	126	62	8	449	141	372	155	1464	1131	0	3908

Source: DPP Socioeconomic Projections, 2007

Table B-9.3. General Demographic Characteristics of the North Shore RegionGeneral Demographic Characteristics: 2000
North Shore

Subject	Number	Percent	Subject	Number	Percent
Total Population	18,380	100.0			
SEX AND AGE			HOUSEHOLD BY TYPE		
Male.....	9,641	52.5	Total households.....	5,893	100.0
Female.....	8,739	47.5	Family households (families).....	4,361	74.0
			With own children under 18 years.....	2,102	35.7
Under 5 years.....	1,511	8.2	Married-couple family.....	3,314	56.2
5 - 17 years.....	3,149	17.1	With own children under 18 years.....	1,602	27.2
18 - 64 years.....	11,846	64.5	Female householder, no husband present.....	682	11.6
65 years and over.....	1,874	10.2	With own children under 18 years.....	337	5.7
Median age (years).....	31.3	-	Non-families.....	1,532	26.0
			Living with nonrelatives.....	509	8.6
RACE			Living alone and 65 years and over.....	275	4.7
One Race.....	13,930	75.8	Households with individuals under 18 years.....	2,511	42.6
White.....	6,696	36.4	Households with individuals 65 years and over.....	1,278	21.7
Black or African American.....	607	3.3	Average persons per household.....	3.05	-
American Indian and Alaska Native.....	65	0.4	Average persons per family.....	3.60	-
Asian.....	5,111	27.8	Median age of householder.....	45.7	-
Native Hawaiian and other Pacific Islander.....	1,032	5.6	Owner.....	54.7	-
Other.....	419	2.3	Renter.....	37.0	-
Two or more races.....	4,450	24.2			
Race alone or in combination with other races:			HOUSING OCCUPANCY AND TENURE		
White.....	9,874	53.7	Total Housing Units.....	6,648	100.0
Black or African American.....	864	4.7	Occupied units.....	5,893	88.6
American Indian and Alaska Native.....	500	2.7	By owner.....	2,595	39.0
Asian.....	8,385	45.6	By renter.....	3,298	49.6
Native Hawaiian and other Pacific Islander.....	3,808	20.7	Vacant units.....	755	11.4
Other.....	1,194	6.5	Other than for sale or for rent.....	527	7.9
RELATIONSHIP			Available housing vacancy rate (%).....	3.7	-
Total population.....	18,380	100.0	Homeowner vacancy rate (%).....	1.1	-
In households.....	17,980	97.8	Rental vacancy rate (%).....	5.7	-
Householder.....	5,893	32.1	Homeownership rate (%).....	44.0	-
Spouse.....	3,314	18.0			
Child.....	5,470	29.8			
Grandchild.....	808	4.4			
Parent.....	204	1.1			
Other relatives.....	887	4.8			
Nonrelatives.....	1,404	7.6			
In Group Quarters.....	400	2.2			
In nursing homes.....	-	0.0			

Source: 2000 Census SF1 File; Planning Division, Honolulu Department of Planning and Permitting

January 2002

Appendix C: Water Quality and Water Quality Management Issues

Appendix C

Water Quality and Water Quality Management Issues

Streams

The 2006 State of Hawaii Water Quality Monitoring and Assessment Report contains a list of inland streams that do not meet State water quality standards and are given the term Water Quality-Limited Segments, or impaired waters. They are ranked in order of pollution severity and water use. Based on assessments performed in 2004 and 2006, the North Shore region has the following Water Quality-Limited Segments and their constituents of violation: KiiKii Stream (NO₃/Total N/Turbidity), Kaukonahua Stream (NO₃, Total N, Turbidity).

The USGS has historical water quality data for a number of streams in the North Shore region. Table C-1 contains data for a few water quality parameters as presented in the 1987 Belt Collins study. Water quality standards for streams in the state of Hawai'i are contained in Title 11, Chapter 54 of Administrative Rules, State of Hawai'i [Section 11-51-05(c)(2)]. According to the historic data, sampling stations near Haleiwa indicate that Helemano and Opaepala Streams exceed the State standards for specific conductance and nitrite and nitrate nitrogen (for both wet and dry periods). Turbidity levels at all three monitoring stations show a wide variation in relation to the existing standards. The USGS data only reports orthophosphorus and not total phosphorus. Consequently, total phosphorus levels may still exceed the present wet-weather standard.

The historic data for Opaepala Stream near Wahiawa indicates that it generally satisfies the standards for specific conductance and nitrite and nitrate nitrogen at this location. Turbidity levels are exceeded only on occasion. Orthophosphorus levels there appear to be lower than the levels in the downstream sections near Haleiwa.

Table C-1. Historical Water Quality Data For Various Streams in Study Area ^(a)

Stream	Year	Site	Conductivity (micromhos) or Salinity (ppt)	Turbidity (NTU)	Nitrite & Nitrate (mgN/l)	Total Phosphorus (mgP/l)	Orthophosphorus (mgPO ₄ /l)
State Water Quality Standard			300.0	2.0	0.3	0.3	0.3
Helemano	1970	n/a	105	1.00	0.400	-	n/a
	1971	n/a	540	1.00	5.600	-	0.060
	1972	n/a	750	110.00	1.800	-	n/a
	1973	n/a	554	1.00	1.300	-	n/a
	1974	n/a	93	90.00	0.970	-	0.040
	1975	n/a	262	1.00	0.770	-	0.080
	1976	n/a	243	30.00	0.900	-	0.020
Opaepala (Near Haleiwa)	1971	n/a	310	15.00	3.600	-	0.060
	1972	n/a	460	1.00	0.800	-	n/a
	1973	n/a	495	0.00	2.200	-	n/a

Table C-1. Historical Water Quality Data For Various Streams in Study Area ^(a)

Stream	Year	Site	Conductivity (micromhos) or Salinity (ppt)	Turbidity (NTU)	Nitrite & Nitrate (mgN/l)	Total Phosphorus (mgP/l)	Orthophosphorus (mgPO ₄ /l)
Opaeula (Near Wahiawa)	1970	n/a	40	5.00	0.500	-	n/a
	1971	n/a	65	0.00	0.000	-	0.000
	1972	n/a	50	1.00	0.000	-	n/a
	1973	n/a	54	2.00	n/a	-	0.100
	1974	n/a	35	4.00	0.000	-	0.020
	1975	n/a	52	2.00	0.000	-	0.020
	1976	n/a	49	3.00	0.000	-	0.000

^(a) Historical data from USGS annuals, 1970-1977, as cited in BCA 1987 Facility Plan

For the 1996 Hydro Resources study, further water quality sampling and analysis was conducted on a broader range of water quality parameters to better characterize the streams of the North Shore region. Table C-2 contains the results of this sampling and analysis effort.

Table C-2. Water Quality Sampling and Analysis From 1996 Supplemental WW Facilities Plan ^(a)

Stream	Site	Conductivity (micromhos) or Salinity (ppt)	Turbidity (NTU)	Non-filterable Residue (mg/l)	Bio-chemical Oxygen Demand (mg/l)	Ammonia (mgN/l)	Nitrite & Nitrate (mgN/l)	Total Phosphorus (mgP/l)	Fecal Coliform (col/100ml)
State Water Quality Standard		300.0	2.00				0.3	0.3	
Anahulu	AN1	14ppt	2.85	7.50	<2.00	0.030	0.337	0.067	490.00
Helemano	He1	13ppt	5.00	16.20	3.47	0.128	1.900	0.119	450.00
Kaukonahua	Ka1	1500.00	4.62	5.40	<2.00	0.316	3.170	0.134	1800.00
	Ka2	490.00	19.20	33.50	3.08	0.020	0.008	0.085	n/a
	Ka3	126.00	4.05	2.20	<2.00	0.011	0.314	0.053	25.00
	Ka4	188.00	13.90	8.70	2.29	n/a	n/a	n/a	310.00
Kiikii	Ki1	23ppt	3.95	20.80	<2.00	0.004	0.318	0.074	33.00
	Ki2	18ppt	5.87	15.80	<2.00	0.115	0.542	0.102	100.00
Paukauila	Pa1	14ppt	3.81	14.60	2.97	0.153	0.004	0.129	42.00
	Pa2	16ppt	5.84	12.80	6.79	0.100	0.040	0.132	2900.00

^(a) Hydro Resources International, 1996

Sampling sites were at low elevations in the streams, with the exception of Kaukonahua Stream which was sampled once upstream near the Wahiawa Reservoir dam and twice at two sites located in the lower reaches of the stream. Site Ka-4 was in the reservoir impoundment itself. All other streams were sampled low enough that saltwater ingress from Kaiaka or Waialua Bays probably caused brackish water estuarine conditions on occasion. Salt water ingress would be especially noticeable during dry weather-low water conditions when reduced seaward flows allow brackish water to intrude farther upstream.

Only the most upstream site of Kaukonahua stream met the state standard of specific conductance. Sites Pa-1, Ki-1, Ki-2, An-1, and He-1 were apparently getting some influence from brackish water. Nutrient levels (as measured by nitrite and nitrate nitrogen and/or phosphorus) only met state standards at the site Ka-2 (Kaukonahua Stream) and Paukauila Stream. In general, turbidity was high and no sites met state standards. Fecal coliform counts were also high, and only three sampling sites met state water quality criteria.

A comparison of water quality data from the HRI sampling and USGS sampling indicate that nutrient levels can vary substantially within a watershed, and that in general, stream water quality improves farther up the stream course. Non-point sources are the primary cause of water quality degradation in the region. All of the watersheds in the area have been substantially altered for agricultural purposes. Diversions, impoundments, reduced stream-flows, siltation from cultivation and military land use practices, and nutrient loading from fertilizers and other agricultural chemicals have been factors in the reduction of stream water quality.

Marine Waters

The 2006 State of Hawaii Water Quality Monitoring and Assessment Report contains a list of marine waters that do not meet State water quality standards and are given the term Water Quality-Limited Segments. They are ranked in order of pollution severity and water use. Based on assessments performed in 2004 and 2006, the North Shore region has the following marine Water Quality-Limited Segments not meeting Enterococcus standards: Waimea Bay, Haleiwa Beach Park, and Kaiaka Bay.

Historical shoreline monitoring data of indicator bacteria is shown on Figures C-1 through C-10 for the 5 sub-districts in the North Shore Region. Review of the *Clostridium Perfringens* data showed levels exceeded the Hawaii shoreline water quality maximum levels in 12.5% of the samples and Enterococcus bacterial levels exceeded maximum State shoreline levels in 34% of the samples. The “higher” bacterial levels do not indicate the source of the bacteria, so do not demonstrate contamination from wastewater or cesspools. The higher bacterial concentrations could be related to groundwater contamination (from cesspools or other sources), runoff, or even laboratory/sampling variations.

None the less, there are still many cesspools in the North Shore district and cesspools are not designed to provide significant treatment, mostly just suspended solids are removed. The best opportunity for any treatment occurs by organisms in the soil as the wastewater migrates towards the groundwater and ultimately the ocean. The level of treatment is highly variable depending on soil type and structure. Based on what is known about cesspools it is almost certain that they are contributing to water quality degradation in the region. More intense monitoring would be necessary to identify and quantify the level and location of contamination resulting from the cesspools.

Groundwater

The North Shore region’s plantation history has led to small levels of groundwater contamination. Figure C-11 shows existing groundwater well locations that have been found to be contaminated based on the 2005 Groundwater Contamination Maps developed by the Hawaii DOH. The North Shore region contains 9 of these locations, numbered 43 through 51. Table C-3 shows the constituents and concentrations for each of these well sites.

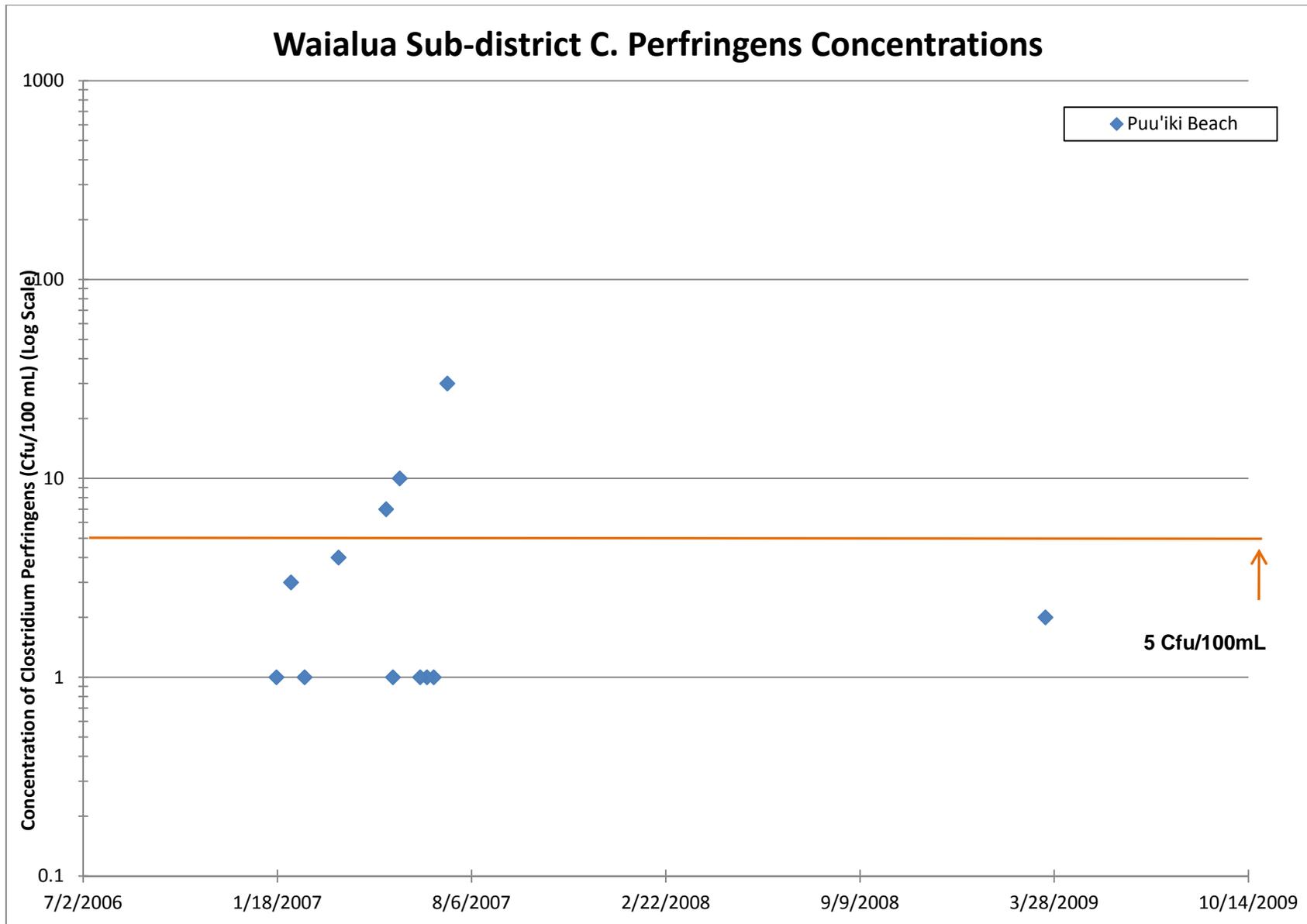


Figure C-2. Clostridium Concentrations at Various Waialua Beaches

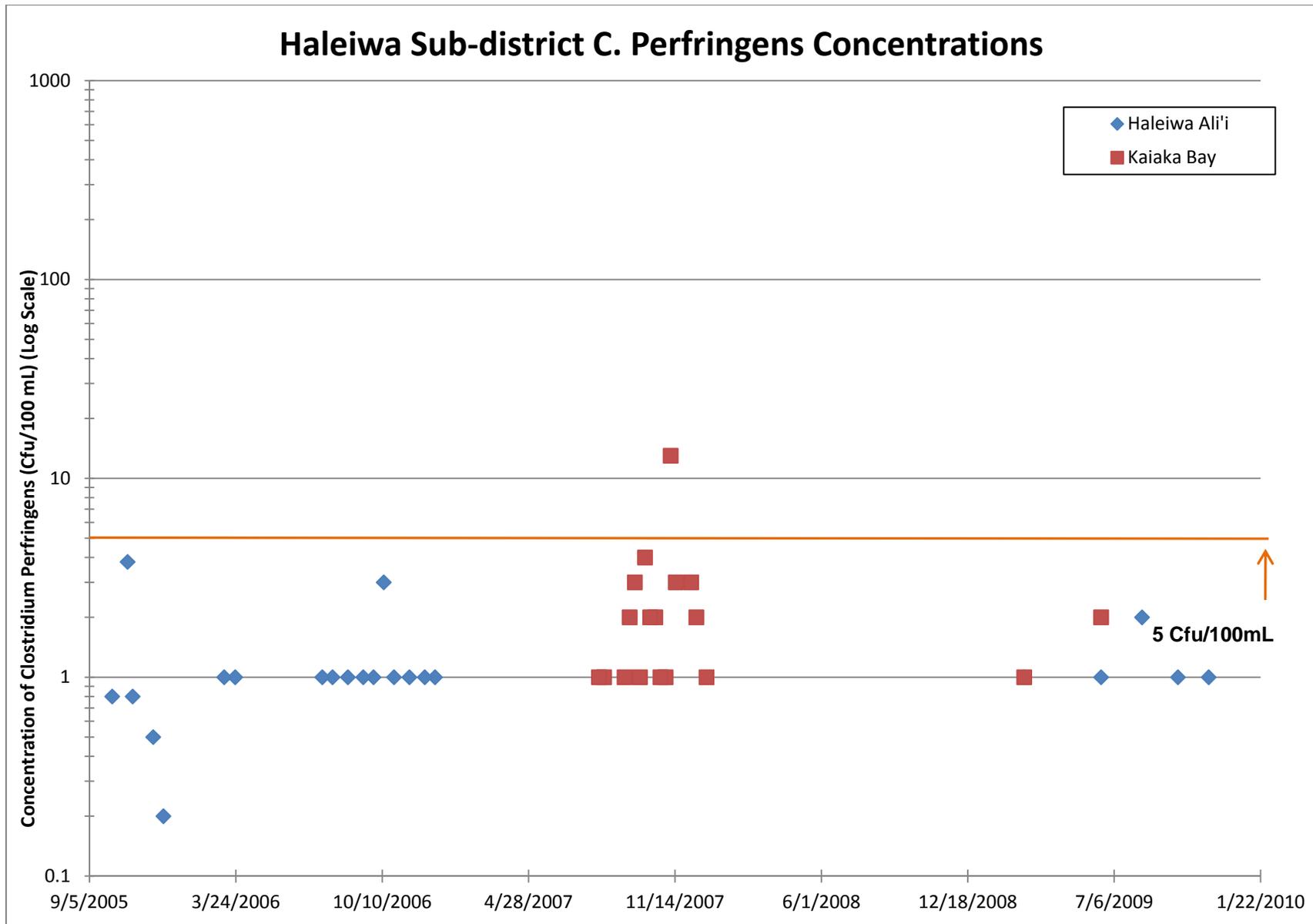


Figure C-3. Clostridium Concentrations at Various Haleiwa Beaches

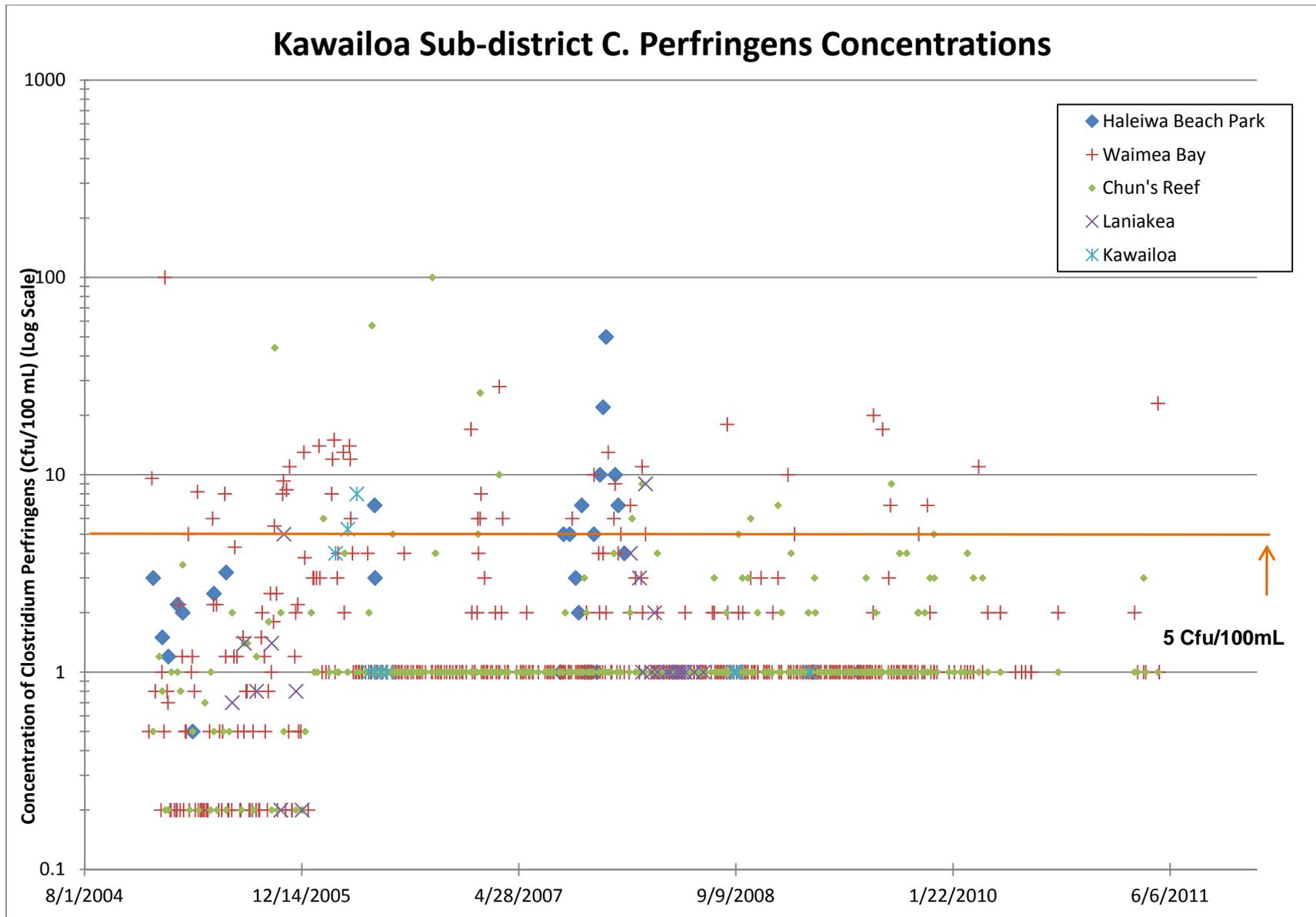


Figure C-4. Clostridium Concentrations at Various Kawailoa Beaches

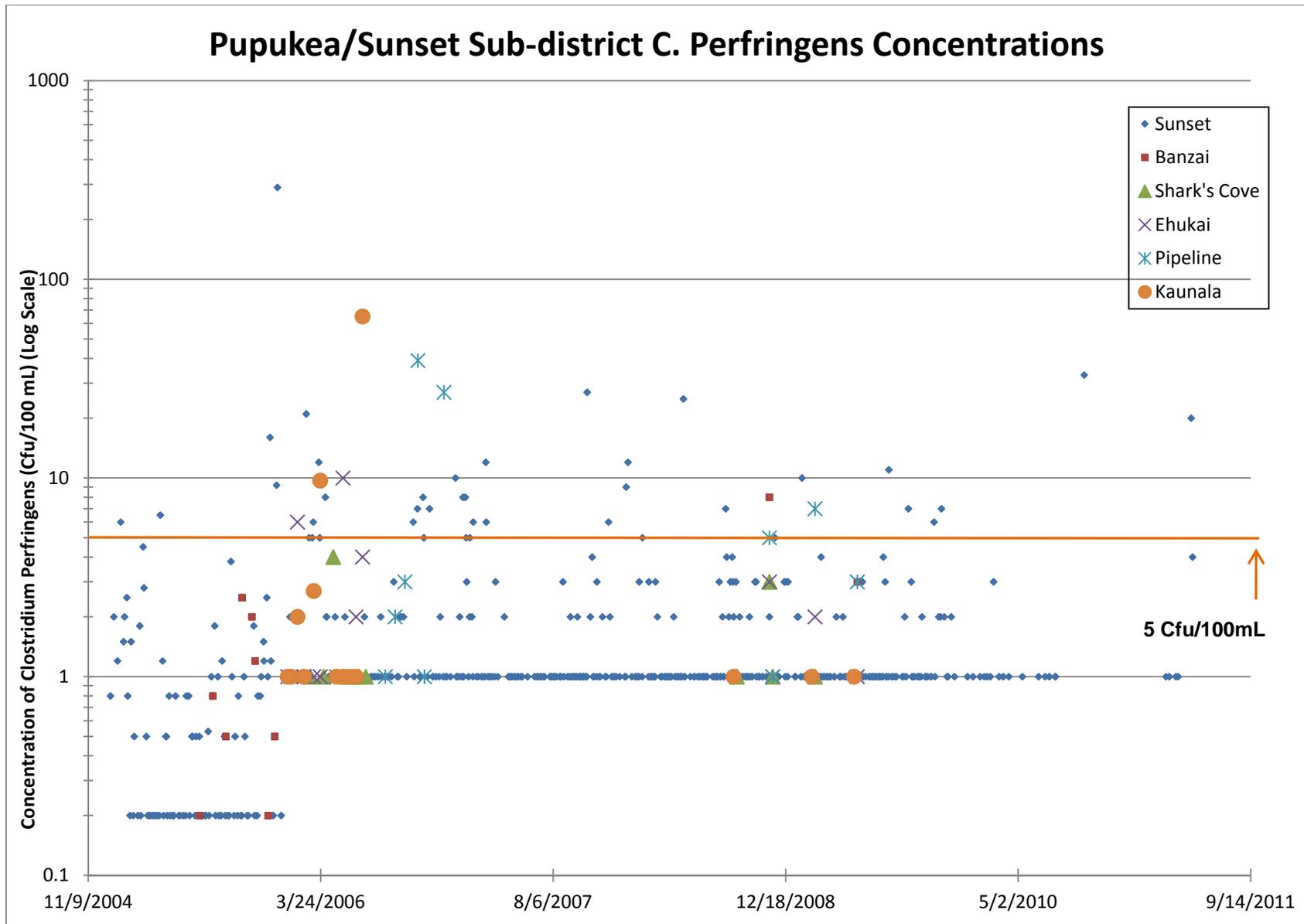


Figure C-5. Clostridium Concentrations at Various Pupukea/Sunset Beaches

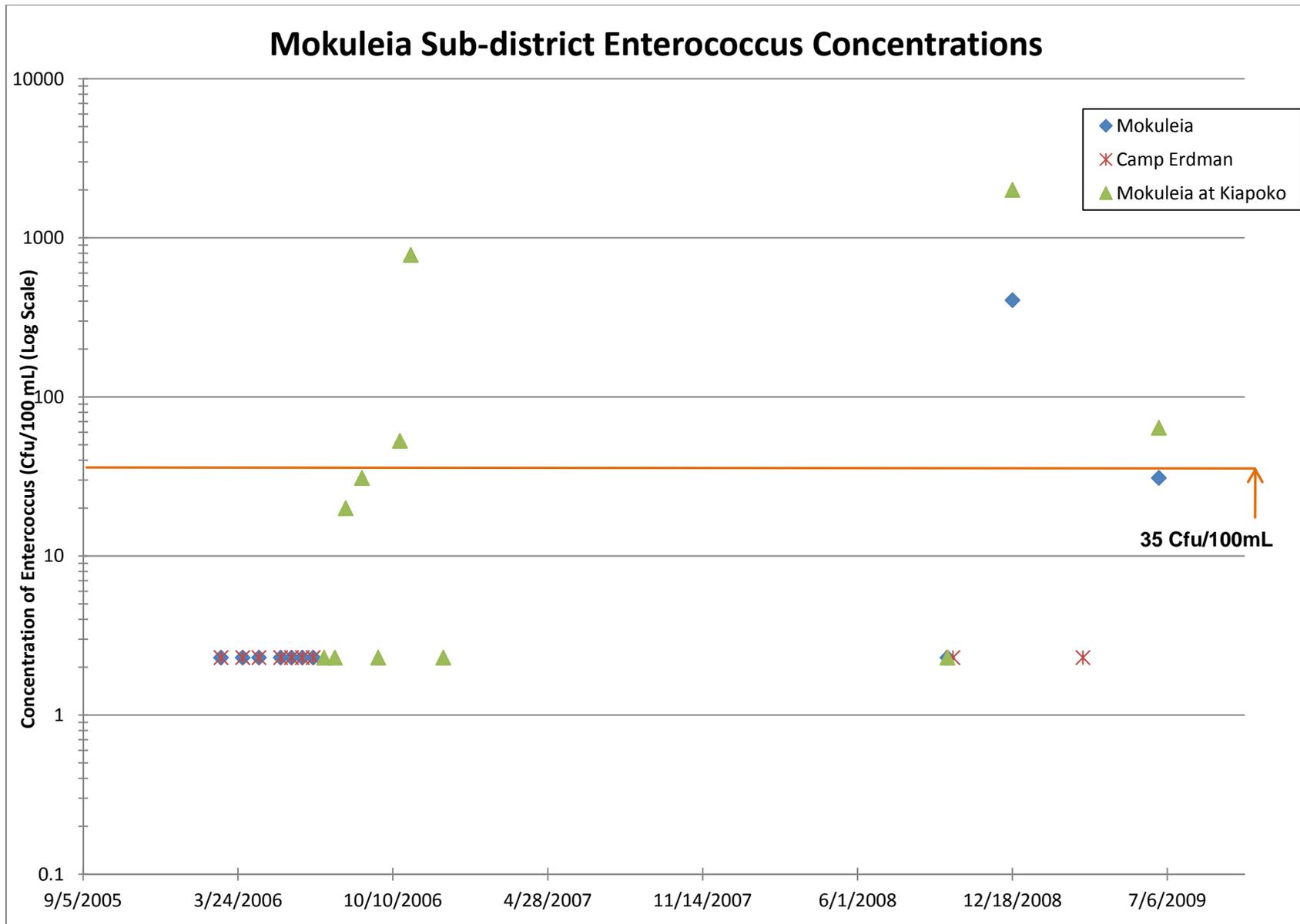
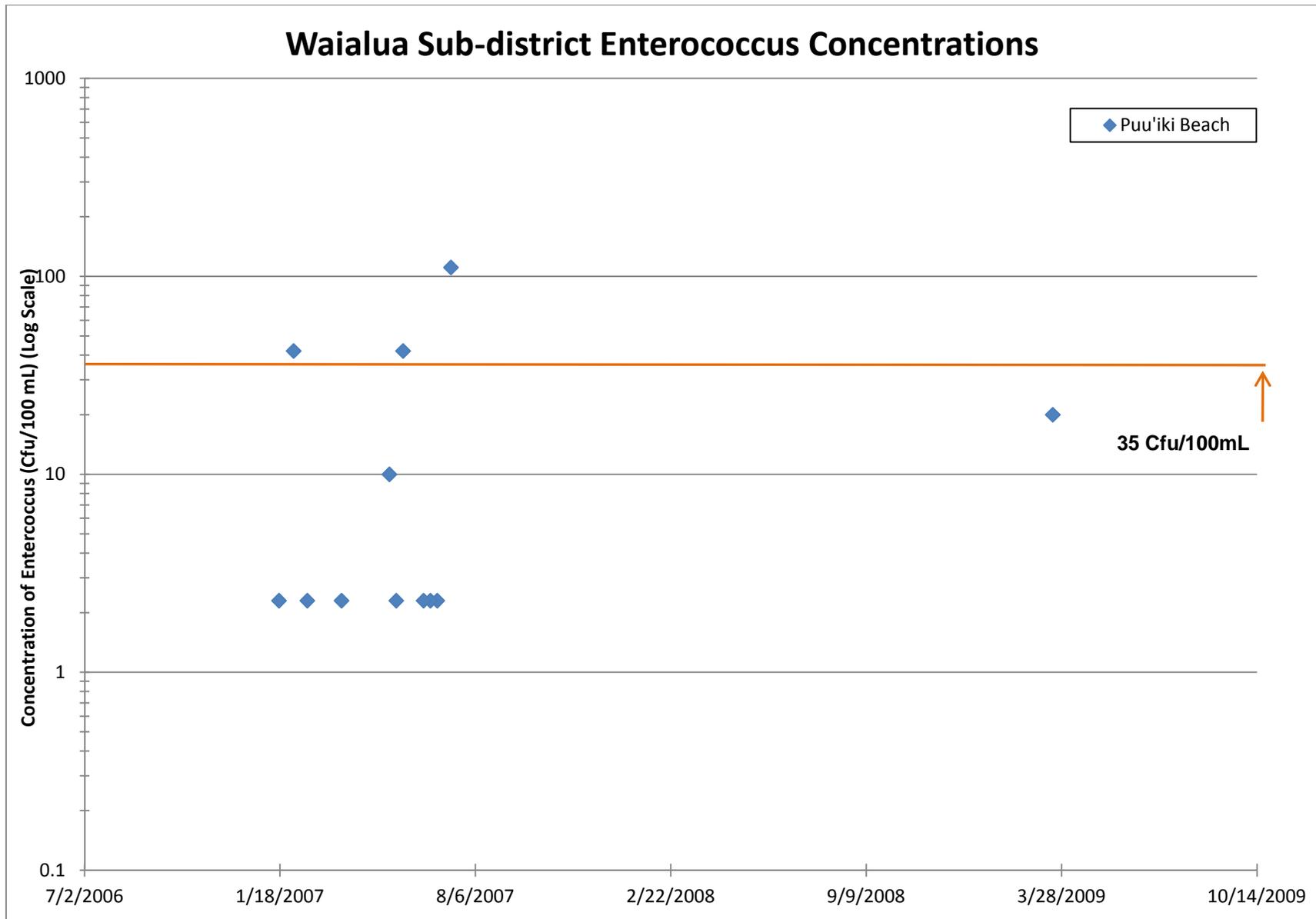
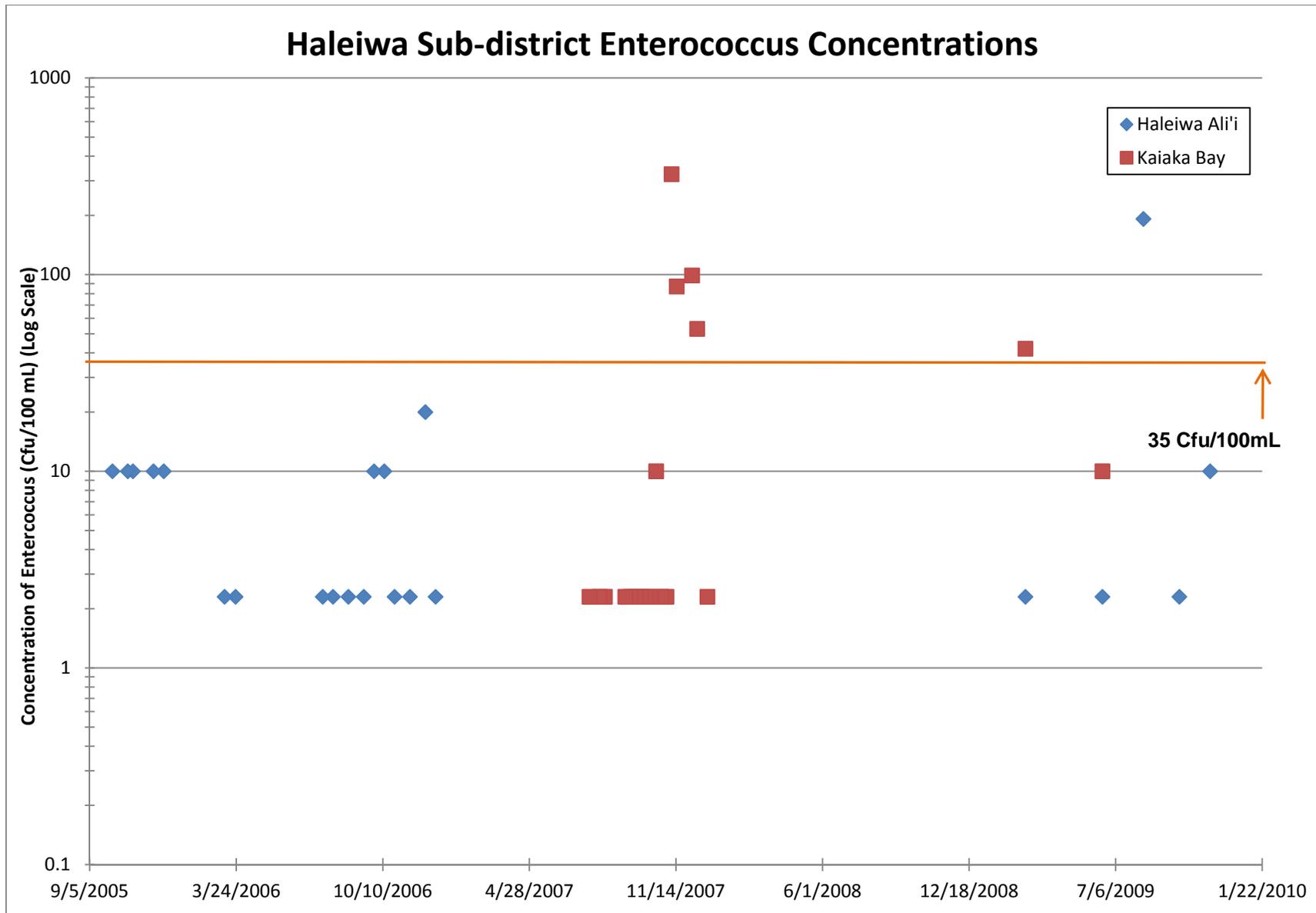


Figure C-6. Enterococcus Concentrations at Various Mokuleia Beaches





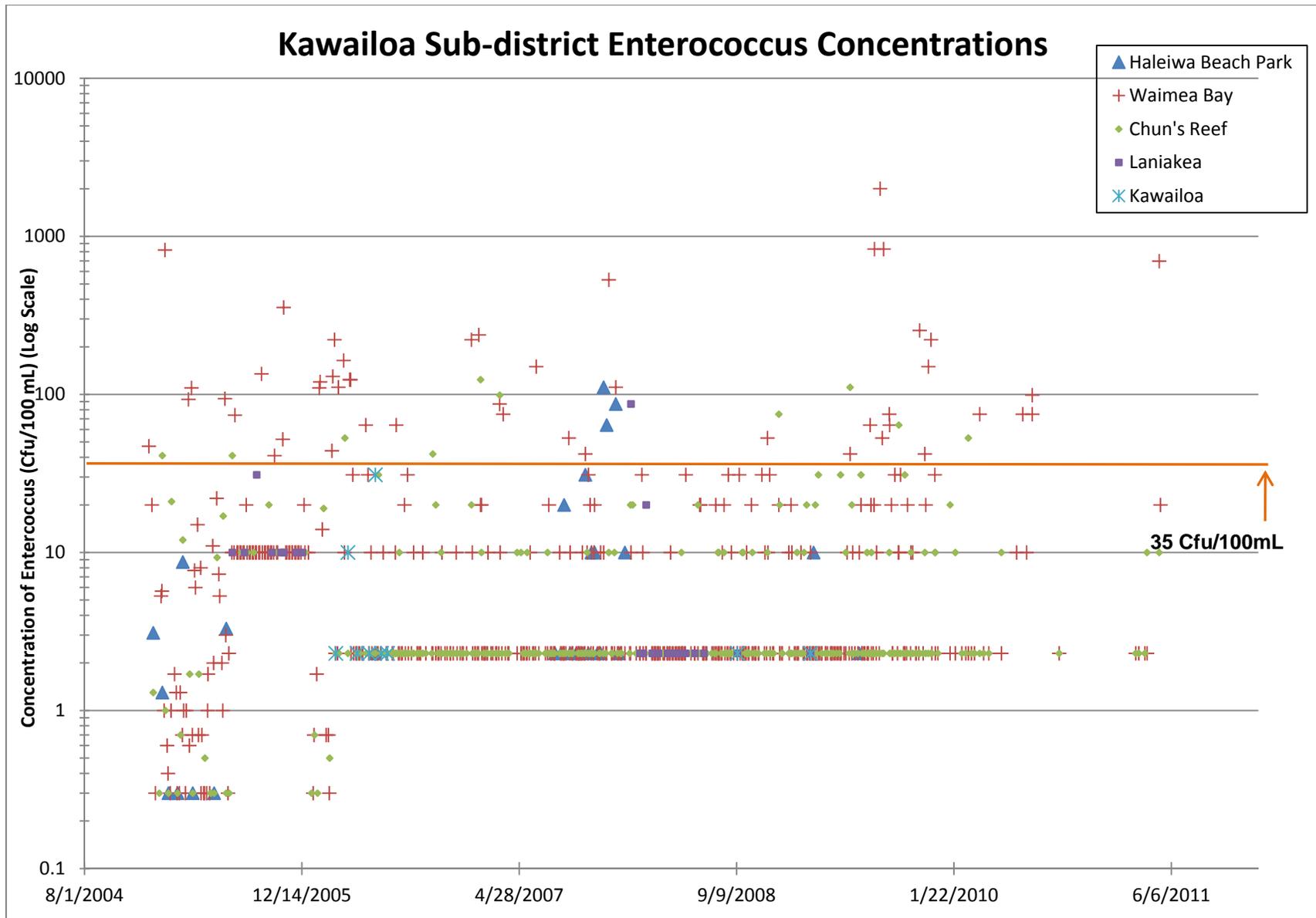


Figure C-9. Enterococcus Concentrations at Various Kawailoa Beaches

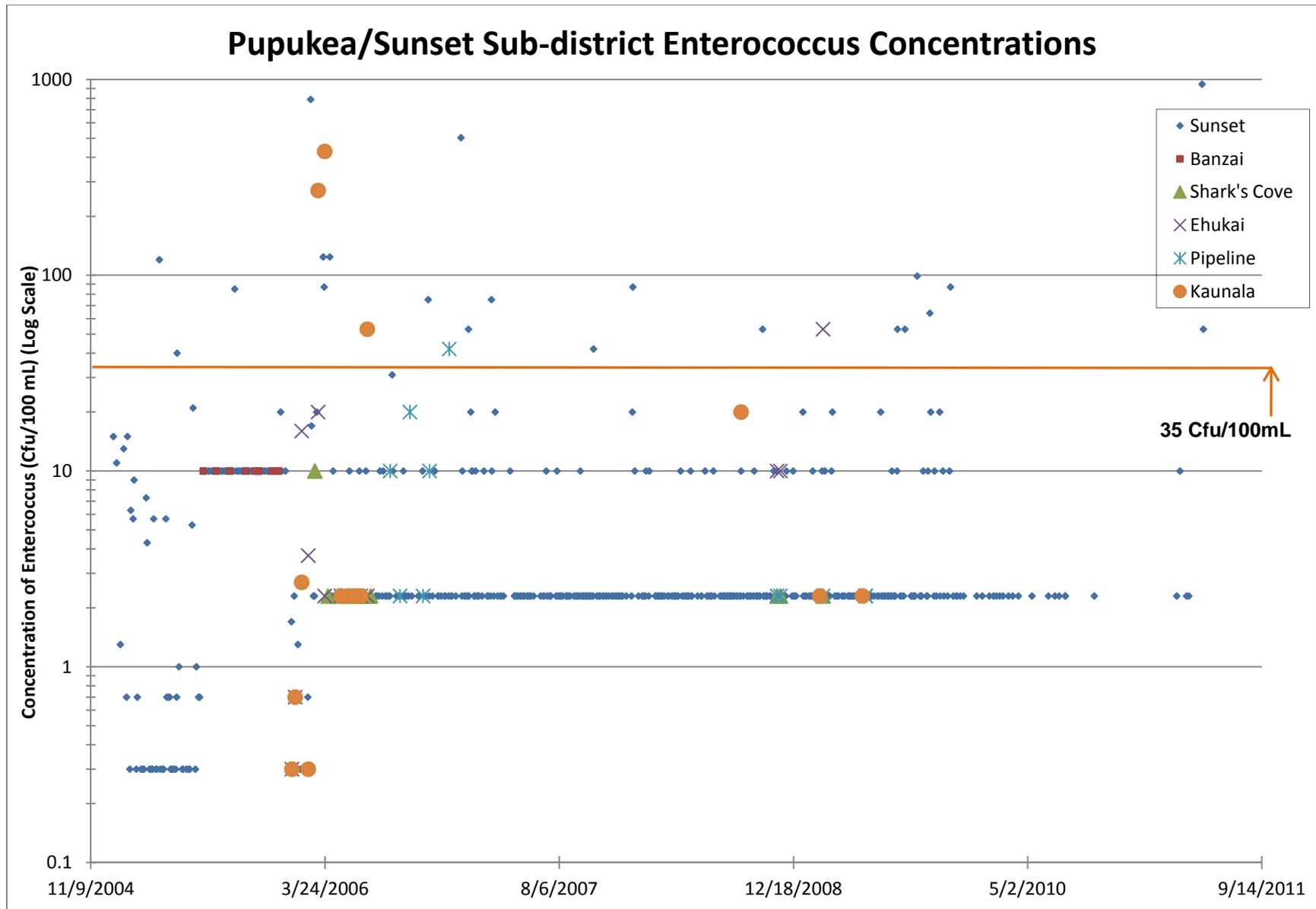


Figure C-10. Enterococcus Concentrations at Various Pupukea/Sunset Beaches

ISLAND OF O'AHU 2005 GROUNDWATER CONTAMINATION

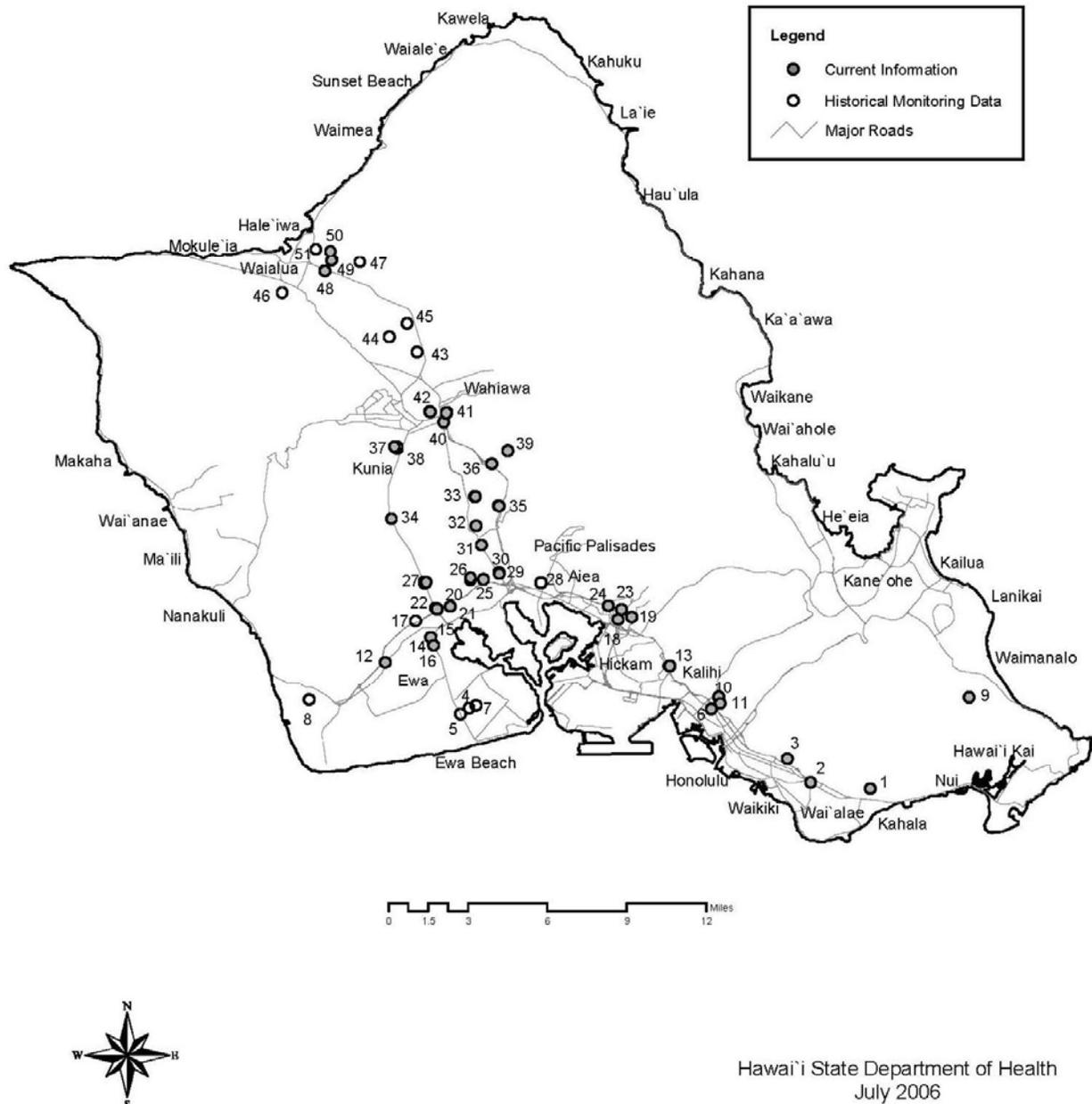


Figure C-11. Groundwater Contamination Map for Well Sites on Oahu

Table C-3. Oahu 2005 Groundwater Contamination Data

Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date	State Stnd	Federal Stnd (ppb)
43	3102-02	Waialua Sugar P24	IRR	DBCP	0.02	8/20/84		0.04
43	3102-02	Waialua Sugar P24	IRR	TCP	0.5	6/3/85		0.60
44	3203-01	Waialua Sugar P25	IRR	DBCP	0.12	6/7/83		0.04
45	3203-02	Waialua Sugar P26	IRR	DBCP	0.01	6/3/85		0.04
45	3203-02	Waialua Sugar P26	IRR	TCP	0.8	6/3/85		0.60
46	3307-01	Waialua Battery P2	DW	Atrazine	0.12	11/4/92		3.00
46	3307-01	Waialua Battery P2	DW	Desethyl Atrazine	0.15	11/14/92		N/A
47	3404-02	Waialua Sugar P17	IRR	DBCP	0.06	11/9/93		0.04
47	3404-02	Waialua Sugar P17	IRR	TCP	1.1	11/9/93		0.60
48	3405-01	Waialua Wells P1	DW	TCE	NQ<0.5	12/5/05		5.00
48	3405-01	Waialua Wells P1	DW	TCP	0.24	11/21/05		0.60
48	3405-01	Waialua Wells P2	DW	TCE	NQ<0.5	12/5/05		5.00
48	3405-01	Waialua Wells P2	DW	TCP	0.28	11/21/05		0.60
49	3405-03	Haleiwa Well P1	DW	DBCP	NQ<0.04	12/15/04		0.04
49	3405-03	Haleiwa Well P1	DW	TCE	0.5	12/15/04		5.00
49	3405-03	Haleiwa Well P1	DW	TCP	0.62	12/15/04		0.60
49	3405-04	Haleiwa Well P2	DW	DBCP	NQ<0.04	12/15/04		0.04
49	3405-04	Haleiwa Well P2	DW	TCE	0.5	12/15/04		5.00
49	3405-04	Haleiwa Well P2	DW	TCP	NQ<0.04	12/15/04		0.60
50	3505-01-20	Waialua Sugar P3	Inactive	DBCP	NQ<0.04	7/24/97		0.04
50	3505-01-20	Waialua Sugar P3	Inactive	TCP	NQ<0.5	7/24/97		0.60
51	3506-03	Haleiwa Battery	IRR	Atrazine	0.13	11/4/92		3.00
51	3506-03	Haleiwa Battery	IRR	Lindane	0.01	11/12/87		0.20

Appendix D: Community Engagement Process Supporting Documentation

Appendix D

Community Engagement Process Supporting Documentation

D-1: Key Informant Interviewees and Interview Notes

Interviewees: Jeffrey Alameida, Antonio Alfredo, Diane Anderson, Cathy Aoki, Jimmy Awai, Doug Cole, Kalani Fronda, Ed Gonsalves, Josh Heimowitz, John Hirota, Lisa Izumi, Valerie Kardash, Susan Lau, Joe Lazar, Robert Leinau, Ollie Lunasco, Michael Lyons, Susan Matsushima, Blake McElheny, Gerri Meade, Antya Miller, Jacob Ng, Ron Nishihara, Kathleen Pahinui, Carol Phillips, Edith Ramiscal, Randy Rarick, Warren Scoville, Ron Valenciana

- Need data to be able to understand current issues, such as runoff and seepage.
- Under existing conditions, how many additional units could be built?
- Unfair to have this discussion without solid data.
- Need to know who would benefit from wastewater improvements – developers? Large landowners?
- Lake Wilson is an ongoing concern – waters flowing into Kaiaka Bay.
- What is happening with near shore ocean monitoring?
- Where are the highest concentrations of cesspools along the ocean and near pristine beaches?
- Concern about Turtle Bay and additional visitors to the North Shore.
- How will Kamehameha Schools' master plan affect area?
- Is a wetlands type facility possible at the old fishpond (Ukoa Marsh)?
- North Shore will get some development (inevitable). Why should residents pay for it?
- Where should a large centralized system be placed? Anything past Sunset will be a problem.
- Would be good to have some growth near Haleiwa – good for families and local people.
- Waialua - many retirees on fixed incomes.
- Lake Wilson – R2 level of treatment. Not good.
- Need people at the table (CWG) from the large landowners who are able to act and make decisions.
- Ignorance prevails – people lack technical knowledge.
- Engineers do know what needs to be done; but this approach not really community-based.
- North Shore famous for level of acrimony.
- Need to tie money to plans – economies of scale.
- Figure out water equation – clean water in/clean water out (can be reused).
- High numbers of outdoor showers a concern.
- Need answers to basic questions re: different treatment processes.
- North Shore Sustainable Communities Plan – good, community-based plan.

- Would prefer smaller systems, not one big plant.
- Need cost comparisons for different systems tailored to different areas.
- Some neighborhoods can/have put in their own systems.
- Absence of a wastewater system has prevented growth in Haleiwa, which was a good thing. Now there are enough controls for a system and some growth to be ok.
- Sunset Beach community – worst offenders in terms of cesspools leaking into ocean waters.
- North Shore has been politically weak – low on the priority list for infrastructure improvements.
- 51% of all overnight visitors come to the North Shore.
- Haleiwa - cesspools overflow; businesses cannot open their restrooms to the public.
- Need a central facility for Haleiwa Town – Kamehameha Schools has land; could run treated water to wetlands.
- Chamber working relationships with the City have been problematic in the past. Need to build a consensus among Chamber members as to future plans and improvements.
- Businesses concerned about disruptions to businesses caused by public works projects.
- More wealth moving into area; traffic also getting much worse.
- Waialua Town Master Plan called for 400 new housing units. Castle and Cooke concerned about the need for infrastructure.
- Is storm water within this project's scope?
- City is suing Castle and Cooke for an easement to Lake Wilson.
- Concern re. Wahiawa dam and spillway leading to Kaukonahua Stream and Kaiaka Bay.
- R1 water could be readily used up if available.
- Flooding problems at Otake Camp.
- If and when something gets built (wastewater facilities), where will the land come from? Probably the large landowners.
- Need to balance “country” with population growth and tourism. Lack of infrastructure; water is a limiting factor.
- Concerns about Turtle Bay and vacation rentals.
- Interested in possibilities around bioremediation and conservation – limit water use on-site. Would help avoid the chaos of building a sewage treatment plant; could be cost-effective.
- There will be more development between Haleiwa and Wahiawa.
- Concerns about Lake Wilson water going into Kaiaka Bay.
- North Shore has been pathetically under-resourced – e.g., Haleiwa Beach Park restroom leaking sewage into the ocean and seawall deteriorating. Should relocate bathroom.
- Less tourism projects; more to improve lives of residents.
- Community feels neglected. N.S. is a low priority for policy makers. Can talk with City department heads but there is no follow-up.
- Haleiwa Town - businesses need to cater to visitors.
- Community would be fine with not having a treatment plant.
- Treatment should be localized.
- Type of treatment should depend on makeup of the soil.
- Lots of contaminants in the soil.

- Concerns re: vacant agricultural lands.
- Lack of planning re: soil erosion into Kaiaka Bay.
- Haleiwa Road floods - can't use cesspools (major problem); Neighborhood Board (N.B.) wanted City to put in a drainage system.
- Disappointed over inability to dump at Whitmore Village.
- Should not have any outflow to ocean or streams.
- Some water testing (stream) was contracted by Department of Health. Results have not been shared with N.B. yet.
- City must upgrade and use treated Lake Wilson water.
- Increasing sewage fees would hit seniors hard.
- State appropriated \$75k for City to test N.S. waters.
- Have alternatives for people. Look to Japan for creative ideas and technology.
- Ocean waters are an asset and destination. Maintaining quality is a concern.
- Prefer upgrading to septic systems (are there recent advances?).
- Diverse neighborhoods - Pupukea is all acre lots - probably not a problem; Waialua is biggest problem with cesspools backing up or failing; Haleiwa Town - makes sense to have a bigger system and more public bathrooms.
- Limited infrastructure; not enough upkeep; can't keep up with growth; limits growth.
- Negative impacts such as increased roadway traffic, overtaxed park facilities.
- According to N.S. Sustainable Community Plan, minimal growth foreseen for region. Daytime population much larger (tourists, illegal vacation rentals, Turtle Bay).
- Need to plan 30 years out; don't want another subdivision like Mililani.
- Keep sold lands in agriculture.
- EPA could rule out cesspools – what would be the response to this and at what cost?
- After last real estate boom, 70% of sales in Sunset area were to wealthy people who don't live there.
- Waialua has an older, more stable population.
- Plan should have a series of options for various areas.
- Have pooled projects to serve small groups of people.
- N.S. Marketplace and Haleiwa Shopping Plaza are upgrading their systems.
- Ukoa marsh possible as a wetlands treatment area.
- City has proposed some solutions – differences over how to go about making changes.
- NSWWTF approach of having sub-regional systems is a good one.
- Kamehameha Schools about one-third of the way through its master plan process – how to meet the needs of current and future lessees; how to not only sustain but strengthen communities.
- Pumping cesspool once every three months at \$140 per visit. Can live with this, but feds will eventually say no cesspools.
- Septic systems are not necessarily trouble free.
- Newcomers' way of looking at things totally different.

- Where to locate a system? NIMBY, no wetlands or outfalls; nothing will happen until it has to. Won't happen in his lifetime - things are not bad enough yet. Politicians need to make up their minds; also need to have a vision and plan for what N.S. should be.
- If rich people move into Mauka developments, developers will put in their own systems.
- City could jointly develop systems with developers, landowners.
- Region is low priority to the City; community is not holding its breath.
- How much will it cost homeowners to change systems? Concern about people on fixed incomes.
- Sunset area overcrowded from rentals.
- Would like to keep the area rural.
- Integrate types of treatment with lifestyle.
- Cost is less of an issue if plan reflects community.
- Concerned about illegal rentals.
- Tax incentives for composting and low usage toilets; provide incentives for conservation measures; use waterless urinals in the parks; private companies could provide movable pay-toilet facilities in shopping areas.
- Need somewhat larger scale solution if conditions permit.
- Will plan consider Lake Wilson?
- More education - conservation; cannot put everything down the drain.
- Could find ways for using graywater.
- Limits on building - must put in new septic - City enforcement is uneven.
- Graywater from businesses (e.g., by the old Kua Aina).
- Blue rock has fissures that permit rapid leaching.
- Arsenic and pathogens in streams (per Dr. Yost).
- Sunset Beach - effluent in yards during rainy season.
- Mamo Street - private activated sludge plant.
- City bought old UH experimental farm station - possible for treatment facility.
- Very dense where there are vacation rentals.

D-2: SUMMARY OF CWG II HOMEWORK RESPONSES, March 14, 2008

Fifteen CWG member responses were received. Their input on the five CWG II homework questions is summarized below.

1. WW 101 and additional information desired

WW 101 was rated 4 or 5 out of 5 in terms of usefulness.

Additional information wanted on: small to medium systems; their capacities; examples of where they have been used (especially applications in areas similar to the North Shore); actual costs of various alternatives; legal and regulatory requirements; systems that conserve and/or reuse water; good homeowner practices; and wetlands options

2. Three most important factors in wastewater planning for the NS region

- Costs - lifecycle costs; costs of construction/installation and maintenance; cost to the homeowner; funding options; fiscal impacts
- Recycling, reuse, disposal approaches and methods
- Environmental and health/safety impacts and implications; effects of cesspools on local soils; ocean cleanliness
- Technologies and capacities appropriate for specific areas to be served; future expandability based on needs projected in the NSSCP
- Best locations for systems, given the land area needed for their operation
- Awareness and education for all sectors; communication with all levels of government

3. Observations of failing or faulty wastewater infrastructure on the North Shore (highlighted items cited by two or more respondents)

Pumping trucks everywhere; Haleiwa business area (Jameson's, Haleiwa Shopping Center); not enough public restrooms; Cement City area of Puuiki; Sunset, Iwia Place, Wehiwa Place, Kaunala Place, Comsat Road; Paalaa Kai - inadequate capacity and odors; low lying areas; areas with clay or adobe soil; mountainside of Kamehameha Hwy.; before UH farm at Waialea; areas with leech fields just above the water table; having to haul pumped loads across the island for disposal; septic odor - Haleiwa sump?; rainwater entering systems.

4. Geographic areas in greatest need of upgrades to wastewater infrastructure (highlighted items cited by two or more respondents)

Waiialua - low lying area plus future development; Sunset Beach Mauka and foot of Sunset Beach; Haleiwa Town; Cement City; North Shore beachfront homes; coastal communities (Mokuleia, Sunset Beach, Kawaihoa); all areas need upgrading; public restrooms - Haleiwa Shopping Center, Laniakea, Turtle Beach, Chun's; Lake Wilson outflow into Waiialua; all wastewater systems on the North Shore, consistent with Kamehameha Schools' plans; old taro fields near streams and rivers (high water table)

5. Motivational factors that would make North Shore residents and businesses want to upgrade their current method of wastewater treatment

Economic motivations - incentives (e.g., grants, tax credits, expectations of consistent, reliable service and reduced maintenance costs) and cost-benefit; perceived benefits for the environment, health and safety (tied into public awareness and education); enforced compliance with mandates and penalties; individual and small systems (not having to connect to a city system); localized planning and management; increased conservation and reuse; financial help for seniors; if upgrading will facilitate home expansion; no smells from upgraded systems

D-3: CWG III SCENARIO PLANNING INPUT CATEGORIZED BY MAJOR AREAS, March 4, 2008

Zero Tolerance for Negative Environmental Impacts

Education

- Education – each one teach one
- Traveling educational team at carnivals, schools, and churches

Incentives and Disincentives

- Serious financial environmental incentive plan for people to switch
- No government permits for renovation/new construction unless there are plans that are ‘green’ friendly
- Time limit to convert to ‘green’ after which there will be a monthly/annual financial consequence or lose a portion of your home tax exemption
- Tax exemptions or other breaks for having ‘green’ at home

Regulations, Mandates, Monitoring and Enforcement

- Regulations – Very Important (government, private, community covenants)
- Enforcement equals zero tolerance
- Convert cesspools along coastal areas
- No cesspools
- No ocean outfall
- Constant monitoring
- Testing of site prior to construction
- Re-examine “no pass line”
- Monitor of injection wells
- Identify negative impacts
- Certified specialist submits lab tests

Technologies, Systems, and Alternative Approaches and Strategies (including reuse)

- Alternative energy systems
- Change peoples’ diets
- Make compost within community
- Composting toilets
- Public/private partnerships
- Reverse osmosis
- 2 water system
- Grey water (R-1) Used to irrigate, flush toilets etc
- R-2 potable
- Re-charge aquifer
- Sewer mining – taking wastewater and treat to R-1 or R-0 standards. Thus will not go out to ocean (Australia & other countries)

- Water used for irrigation etc
- Compost solids
 - Treat properly
 - Use for fertilizer
- Establish wetlands that use phyto-remediation to get sewage effluent to R1 for agricultural use. Technology developed and proven by the Dole Wetlands Project in Whitmore Village. This was TVA technology. Adapting the process to be friendlier for Hawaii, with plants that will do the phyto-remediation but survive better in Hawaii

Minimum Financial Burden

Incentives

- Tax credits
- Tax breaks
- Government program
- Tax incentives to convert failing systems
- User incentive: tax relief for upgrading cesspool
- Delayed hookup to community wide system if verification can be made that “his” system works
- Upgrading from cesspool to septic will cause lower maintenance fees
- Tax relief to pay for the system that would be appropriate for commercial and residential as described in wastewater 101
- If owner or business installs a new system, they should not be assessed sewer fees until the 6th year
- Concern about cesspool costs if sewer system put in within a 5 year period

Financing Strategies

- Privatization vs. government
- Federal funding
- Low interest loans or floating bonds
- Different rates per “type” of usage, e.g., hotels, vacation rentals
- Fund (like Superfund) to establish treatment facilities and maintain for certain number of years
- Have a “lottery”
- Rural development grants
- Amortizing costs over 130+ years
- Community financing
- Municipal assets be available to all communities

Technologies and Systems

- Shared use of treatment facilities, e.g., 4-6 homeowners sharing one
- For new developments – have 2 water sources to homes – potable water and less potable water (underground pipes for irrigation)
- Reclaim solids - convert to methane anaerobic
- Upgrading existing systems

- Private neighbor wastewater systems (ex. Mamao St.) - shared costs
- Cluster septic for 4 or more homes

Education

- Education – vs. “just \$150 per year”
- Educating homeowner on cost benefits of conversion

Special Populations

- Fee exemptions for certain groups – elderly, disabled
- Tax breaks - fixed income, elderly, medium income (low income)

Partnerships

- Military resource (Wheeler, Schofield) – use their planning, labor, skills

Ahupuaa Vision

Community Level Initiatives

- More community/individual involvement
- Private management
- Private/public partnerships

Education about Cultural Values and Caring for Limited Resources

- High level of community education and participation – simplify language; kupuna respected/revered
- Enforcement/education/moral & cultural values
- Education for proper water saving techniques
- Quarterly education sessions for residents

Technologies, Alternative Strategies

- Smaller on-site systems (initial cost high, but long term costs low)
- Systems to be non-intrusive
- Less community disruption in event of a break in system.
- Small(within ahupuaa)/decentralized systems (app. to each locality based on soil conditions) – address black water
- How to integrate watersheds into waste management
- Terrace land for hydro power and prevent runoff
- Cesspools in select areas
- Appropriate drainage
- Integration of watershed water w/wastewater (dilution)
- Biological monitoring
- Evaporation areas
- Appropriate land use, as it relates to geographic features

Conservation, Reclamation and Reuse

- Create ponds w/reclaimed water. Grow fish – fish used for fertilizer (PETA notwithstanding)
- Use of gray water: electricity, ag, create habitats, fishponds
- Redefine gray water laws
- Grow ag crops that can utilize gray water
- Utilize “solids” for compost
- Use wetlands for reclamation
- Land banking for reclamation options
- Allow for reclamation plant for processing of waste; self contained; environmentally friendly; North Shore only
- Recycling of run off water from agricultural operation
- Develop synergies with reuse of water from aquaculture production for agriculture
- Develop wetlands to recycle sewage water for agricultural use through phyto-remediation
- Develop home gray water recycling for watering garden and lawns
- Develop community catchment reservoir for irrigation and home gardening use
- Offer incentives for recycling and synergistic partnering for water reuse, e.g., for every 1000 gallons recycled and reused, 1000 gallons at no charge
- 10,000 gallons recycled = 10,000 free water from Board of Water or landowner
- All reclaimed water is preserving ADDITIONAL fresh water from use
- Gray water “retrofitting” for each household willing to participate
- INCENTIVE: lower rates for lower usage - based on previous year’s billings
- Seek grants to set the reservoirs. Those using water from catchment get “ag” rates for water use

Maximum Water Reclamation

Technologies and Approaches

- Type of technology
 - understanding different types of technology
 - practicality of use
 - economic concerns
- Build storage facilities for water
- Areas to dilute “hot” water
- Create distribution systems (reclaimed water)
- Forestation
- Taking water to point where ag products can utilize water
- Proper management, research and implementation of techniques
- Sewer mining – from septic, private sewer systems, etc. (extracting wastewater and treating it for R-1, R-0, useable water)
- Laundry water for watering plants
- Work with Partners in Development (Dr. Jan Dill) who have successfully installed systems at Hualalai for the Four Seasons

Partnerships, Cooperation, and Coordination

- Partnerships - city, state, military, business, homeowners
- Have coordinated government participation (greater integration between agencies)
- Public-private partnerships

Incentives

- Financial incentives
 - Reduction fees
 - Tax break
 - Credit/tax
 - Re-use of resources
- Cheaper water rates (reclaimed water)
- Additional incentives to use water
- Land banking/tax incentive for land owner/transfer development rights
- Tax incentives

Education

- Education of stakeholders from farmer to legislator
 - NIMBY
- Education (various languages) re what is H2O reclamation; how it works, impact on health
 - Residents: (elders, kids)
 - Transients
- Mass education –
 - Media that catches your eye
 - Visual aids
 - “specials” on wastewater
 - Use kids – as people gravitate to children
 - Use MADD methods for education
 - Lobbying in legislature – by community
 - Civic clubs
 - Associations – e.g, Sunset Beach; Haleiwa Mainstreet
 - Elementary Schools
- Education
- Strong community input/support
- Create Focus for Environmental Standards in Gov., as well as private companies.
- Grant writing expertise

Policies and Mandates

- Water Reclamation must be mandated
 - Failure of city to enforce
 - Req. reclamation plan/permits for new developments
 - Not enough enforcement officers

- Limiting use of reclaimed water until “water reclamation (re-use) feels “comfortable” to people.
Limit to agricultural areas, public parks
- Community wide fees for funding
- We have technology. We need money and implementation as well as education of the consumers

D-4: Core Working Group Re-orientation Summary, February 17, 2010

This summary is intended to brief North Shore Regional Wastewater Alternatives Plan (NSRWWAP) Core Working Group (CWG) members on the efforts that took place from the start of the project in the fall of 2007 until work was suspended in March 2008; as well as plans for the remainder of the planning process, now that work has resumed. To support CWG members' return to the process, the following documents are included for your review:

- CWG Meeting #1, October 9, 2007 - PowerPoint presentation
- CWG Meeting #1, October 9, 2007 - Meeting Summary
- CWG Meeting #2, November 27, 2007 - PowerPoint presentation
- CWG Meeting #2, November 27, 2007 - Meeting Summary
- NSRWWAP Guiding Principles, Final, November 21, 2007
- CWG III Scenario Planning Input by Category, March 4, 2008

Progress to Date

CWG Meeting I: CWG members shared the features they cherished most about the North Shore region (CWG Meeting #1, October 9, 2007 - Meeting Summary; pp. 1-2). This information conveys a sense of the qualities that need to be preserved as part of the region's wastewater plans. The overall planning process was outlined; and the following process ground rules were adopted:

- The CWG is advisory to the project team and is the source of community values and priorities
- Collegial and collaborative: CWG - B&C - ENV
- Consensus-based to the extent possible
- Neutral facilitation
- Open information sharing - same information to all members at the same time
- Group memories - record of process
- Absent CWG members - will catch them up; will not repeat discussions
- Start on time and end on time

The group was provided with a draft set of guiding principles for discussion at the next meeting.

CWG Meeting II: The project team presented a Wastewater 101 educational presentation followed by a question and answer period. The group also discussed revisions to the draft Guiding Principles and approved the document as revised (NSRWWAP Guiding Principles, Final, November 21, 2007).

CWG Meeting III: The CWG worked in small groups to brainstorm a wide array of potential options to achieve four planning scenarios for the North Shore's wastewater future (CWG III Scenario Planning Input by Category, March 4, 2008).

The NSRWWAP Process, Going Forward

CWG Meeting IV:

- Re-orient the group
- Discuss changes and developments in the region and beyond that have implications for wastewater planning
- Gather additional input on possible strategies
- Present regional data and other planning information; begin discussion of evaluation criteria

CWG Meeting V:

- Present conceptual alternatives, including the economic implications of these alternatives
- Discuss how community values will be incorporated into evaluation criteria
- CWG Meeting VI:
- Present refined alternatives with preliminary evaluation based on community input on criteria

CWG Meeting VII:

- Discuss and seek consensus on recommended alternatives

Community Meetings: Two community meetings will be conducted to share progress (meeting one) and recommendations (meeting two) with the North Shore community and to gauge the community's response to the planning effort and results.

Prepare Plan and Final Report (Project Team)

D-5: Core Working Group Roster Information

Marianne Abrigo. Owner, Marianne Abrigo Properties

Laura Figueira. Former Staff of Senator Bunda's Office

Judy Hall Fomin. President, North Shore Waste Water Treatment Committee; Special Assistant to Representative Michael Y. Magaoay; Sunset Beach Community Association

Kalani Fronda. Land Asset Manager, Kamehameha Schools

Edwin Gonzales, Jr. President, RME and licensed contractor, Gecko Enterprises, Inc.; Water Environment Federation

John Hirota. North Shore Neighborhood Board #27

Susan M. Lau. AVP and Branch Manager, First Hawaiian Bank Haleiwa Branch; Treasurer, North Shore Chamber of Commerce; Board Member, YMCA Camp Erdman

Joe Lazar. Owner, Haleiwa Joe's Seafood Grill

Roberts "Bob" Leinau. Retired; Haleiwa Main Street/North Shore Chamber of Commerce; Sunset Beach Community Assn.; North Shore Outdoor Circle; North Shore Neighborhood Board #27; Malama Ohana; Malama Pupukea-Waimea; Haleiwa Arts Festival; North Shore Community Land Trust

Michael Lyons. Small business owner – Helemano Plaza and Royal Purple Hawaii; Chair, North Shore Neighborhood Board #27

Garrett J. Matsunami. Director of Engineering & Site Construction, Castle & Cooke Homes Hawaii, Inc.

Susan Matsushima. CEO, Alluvion, Inc.; North Shore Chamber of Commerce; Enterprise Honolulu; 4 Ag Hawaii

Reed Matsuura. Legislative Aide, Council District II

Antya Miller. Executive Director of North Shore Chamber of Commerce; North Shore Neighborhood Board #27; North Shore Chamber of Commerce; Waialua Community Association; Sunset Beach Community Association; North Shore Outdoor Circle

Kathleen M. Pahinui. Vice President, Account Services, Laird Christianson Advertising; North Shore Neighborhood Board #27; Waialua Sub-District Representative; Friends for Waialua Town; Waialua Community Association; North Shore Sustainable Community Plan PAC

Edith Ramiscal. Waialua Farmers Cooperative-Waialua Farmers Market, President 2003-2006, Manager, 2007; Waialua Farmers Cooperative Agent, 2011; consultant to King and I Farmers

Randy Rarick. Executive Director, Triple Crown of Surfing

Warren Scoville. North Shore Neighborhood Board #27

Mark Takemoto. Facilities Services & Real Estate Manager, Pioneer Hi-Bred

Ron Valenciana. Publisher, North Shore News

D-6: CWG and Community Meeting Summaries

NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting I
October 9, 2007
Haleiwa Joe's Seafood Grill
66-011 Kamehameha Hwy.
Haleiwa, HI 96712

Meeting Summary
12/07/07

Welcome and Introductions

Tim Houghton welcomed the group on behalf of the City's Department of Environmental Services (ENV) and thanked the members for their willingness to participate.

Leland Chang asked members to introduce themselves and to share what they cherished about the North Shore.

- Antya Miller: rural agrarian nature of the region and the close-knit community
- Marianne Abrigo: open space, clean water, the people
- T. Dilcher: people can be themselves; great place to raise a family; beautiful environments
- Marianita Lopez: sense of community - everyone knows each other
- Michael Lyons: the people
- Randy Rarick: clean water, the environment; best surf
- Edwin Gonzales: sewage
- Kathleen Pahinui: the North Shore cherishes sustainability, open spaces, low development
- Jeffrey Alameida: families, children and individuality is cherished here
- Joe Lazar: people, open space; NS is like small town but not too small
- Edith Ramiscal: clean water for agriculture
- Judy Fomin: neighbors
- Susan Lau: mix of wonderful people; most beautiful spots
- Cathy Aoki: country setting for next generations
- Susan Matsushima: clean water; potential of area to feed the state
- Bob Leinau: aquatic resources
- Ron Valenciana: daily drive from Haleiwa to Pupukea; weather; generosity at charitable events
- Gerry Meade: blessed ahu`puaa
- Kalani Fronza: natural resources - watershed to ocean
- Mark Takemoto: people on the plantation

Audience members were also asked to introduce themselves and to share what they valued about the area.

- Laura Figueira: exceptional beauty of the land and ocean; potential for agriculture
- Eloise Aguiar: beauty; clean environment
- Mark Glaser: all aspects of the environment

- Bob Schieve: old plantation atmosphere
- Reed Matsuura: clean water
- Pat Ferraris: values, interdependence and amicable relationships
- Alan Sitt: clean water, air and ocean
- Marilee Lyons: sense of community
- Ben Thompson: the people
- Kurumi Ka`apana-Aki: Hawaii's children; future agronomy
- Edward Balidoy: easygoing lifestyle - great for families and for raising kids
- Tim Haverly: concerned about having plans shoved down people's throats

Leland mentioned that CWG members who could not attend were: Diane Anderson, Jimmy Awai, Josh Heimowitz, John Hirota, Blake McElheny, and Warren Scoville.

Background, History, & Context: (Tim Houghton)

- Previous studies that have been conducted on the North Shore came up with recommendations that were not consistent with the culture and values of the region. Therefore, the community did not support them, and no action was taken.
- One clear message that the community gave was that it does not want an ocean outfall.
- Wastewater issues in the North Shore region have been discussed in great detail, especially over the last 5 years or so.
- The North Shore Wastewater (WW) Task Force was formed in 2004 by the North Shore Neighborhood Board to identify potential technologies that could be used on the North Shore.
- This North Shore Regional Wastewater Alternatives Plan will use lessons learned from the previous studies, recommendations from the WW Task Force, and input from the Core Working Group to help guide the planning process.

Question (Leinau): Economic feasibility will be a challenge for the North Shore. It is uncertain as to what the definition of "economically feasible" is. Does the City have an idea of where funding could come from?

Response (Houghton): Primarily, the City gets its wastewater funding through customer sewer service charges. However, there are alternative sources of funding. For example, Laie is close to obtaining a federal grant or loan to help with its wastewater issues. A national trust fund is also being explored at the federal level.

Question (Public): What is the motivation that is driving this project?

Response (Houghton): Typically, every 10-20 years or so the City conducts a status review of wastewater for the various sub-areas on Oahu. The North Shore, with its many cesspools, needs to be re-evaluated. The laws regarding cesspools have changed and become more stringent in the recent past.

Question (Gonzales): If no ocean outfall is to be constructed, is the plan to use wetlands?

Response (Houghton): All potential alternatives will be looked at.

Orientation to the Community Engagement Process: (Leland Chang)Community Engagement and CWG Processes

- The CE process is about the sharing that will happen between the CWG (as representatives of the community) and the technical team.
- Information about community values and technical issues will go both ways.
- A series of meetings for the general North Shore community is being planned in addition to the CWG process.
- There is coordination between the NSRWWAP and the North Shore Sustainable Communities Plan (NSSCP) - overlapping participation; communications between consultant and city agency teams.
- CWG selection sought a broad, balanced representation of NS leadership: N.B., geographic, perspectives of a wide range of sectors (environmental, ocean recreation, financial services, wastewater-related, business (local and visitor oriented clientele), large landowners, non-profit social services, native Hawaiian, education, agriculture, real estate, seniors, churches).
- The CWG will help to develop evaluation guidelines, including a set of guiding principles to serve as underpinnings of the plan; and a set of weighted evaluation criteria with which to assess alternatives. The group will also input on recommended alternatives and review of the draft plan.
- Along the way the group will develop a common knowledge base.
- CWG and Technical Team processes are integrated and contribute to each other.

Project Team

Tim Houghton – Executive Assistant with ENV. Background in wastewater program management. Has been involved with North Shore Neighborhood Board and was a member of North Shore WW Task Force.

Jack Pobuk – CIP (Capital Improvement Projects) Program Coordinator and Professional Civil Engineer with ENV. Has experience with small coastal communities and small wastewater systems.

Audrey Uyema Pak – Civil Engineer with ENV. Has experience with City and Navy projects.

Peter Ono – Project Manager for the technical team. Has 18 years of total experience, with 10 years at Brown and Caldwell. His expertise lies in the preparation of engineering reports and environmental engineering projects involving water and wastewater facilities planning, groundwater development, wastewater management, air quality permitting, design, and post-

design services of wastewater treatment facilities, sewers, force mains, and sewage pump stations.

Darin Izon – Project Engineer for the technical team. Has 10 years of total experience and joined Brown and Caldwell in May of 2006. He is a Waialua native and returned home last year after going to school and working on the mainland for the last 15 years. His expertise lies in the planning, analysis, and design of infrastructure for potable water, recycled water, wastewater, and stormwater facilities.

Ron Crites – Natural Systems Service Leader for Brown and Caldwell. Has 38 years of total experience, with 10 years at Brown and Caldwell. Has conducted numerous evaluations and designs of natural systems and constructed wetlands for water quality improvement and water reuse. He has managed a wide variety of projects including facility plans for wastewater treatment and biosolids management, constructed wetlands for pond upgrades, a recycled water assessment of groundwater impacts from emerging pollutants, and a pilot groundwater recharge program. He is the author of four textbooks including Natural Wastewater Treatment Systems, Small and Decentralized Wastewater Management Systems, Natural Systems for Waste Management and Treatment, and Land Treatment of Municipal and Industrial Wastes.

Berna Cabacungan - Owner of Earthplan, a consulting company specializing in social and community impacts assessment. Conducted the community engagement process for Brown and Caldwell's Central Maui Reclamation Facility Project

Leland Chang - 14 years as a project development consultant: directed start-up of the Hawaii Hurricane Relief Fund; first Special Monitor in U.S. v. State of Hawaii (Hawaii State Hospital); directing community engagement for the HI2050 Sustainability Plan; facilitating collaboration of four state agencies working on reforms at the Hawaii Youth Correctional Facility. Eight years as Executive Director of the Neighborhood Justice Center (now called the Mediation Center of the Pacific).

CWG Guidelines and Groundrules

- The group is advisory to the project team.
- There should be a collaborative and collegial interaction between the CWG and the project team. Consensus will be used as much as possible. The consensus question will not be, "Is everyone happy with the decision?", but rather, "Is there anyone who can't live with it?"
- Neutral facilitation - Leland's role is to facilitate productive interaction; not to take sides or advocate for any position on an issue.
- The public is welcome to attend CWG meetings. CWG members will have a chance to discuss an item until all have had a chance to contribute; then those in the audience who wish to comment will be recognized.
- Meeting summaries will be provided to serve as a record of CWG deliberations.

- Efforts will be made to bring absent members up to speed. However, discussions held at a meeting will not be repeated at subsequent meetings.
- There should be open sharing of information. The project team will provide all CWG members with the same information at the same time. Leland requested that CWG members also adopt this practice when they want to share information with other CWG members. There were no objections to this.
- Meetings will start and end on time.
- Regarding the CWG roster, can the roster be distributed to CWG members? What about distribution outside the CWG? On one hand, the community’s voice can be brought into the process through CWG members; on the other hand, we need to be sensitive to how members want to be contacted or if they want to be contacted at all. This is a chance to say what contact info you want on the roster.

Comment (Fomin): Doesn’t want her email to go outside of the Core Working Group.

Response (Chang): Two separate lists can be created -- one for internal Core Working Group correspondence only, and the other for public viewing. The group concurred.

Question (Dilcher): What geographic boundaries does this plan encompass?

Response (Chang): The plan will be cover the area served by Neighborhood Board No. 27.

Comment (Leinau): Some options should go outside the Neighborhood Board No. 27 boundary.

Orientation to Wastewater Planning: (Peter Ono)

- The planning process will include the following tasks:
 - Review wastewater regulations, standards, and guidelines
 - Conduct an appraisal of the existing environment
 - Assess water quality and water quality management issues
 - Project future development and population growth based on the North Shore Sustainable Communities Plan
 - Evaluate wastewater flows
 - Evaluate existing wastewater infrastructure
 - Evaluate wastewater alternatives
 - Compile the final plan
- The project consultant is a company that employs many wastewater experts with various areas of expertise.
- Although the project consultant will evaluate many treatment alternatives for the North Shore region, it feels that small, decentralized and/or natural systems may be better suited for this area.
- The project consultant team includes Mr. Ron Crites, an expert in wastewater technologies and small-decentralized-natural systems, and co-author of *Small and Decentralized Wastewater Management Systems.*”

- Different communities or sub-areas within the North Shore region may require different wastewater solutions.
- Economic feasibility and affordability to customers will be important factors in the decision making process.
- The planning process will incorporate the sustainability concept in evaluating alternatives. This includes wastewater effluent and biosolids reuse.
- Part of the planning process is to review existing data on water quality. It is uncertain at this point how much information is available, or how many water quality studies have been conducted on the North Shore.
- The overall project has an 18-month timeline.

Comment (Matsushima): Recalls that \$4.2 million was put into a phytoremediation study on Dole land. Perhaps it would be possible to utilize that kind of technology on the North Shore, and Dole might be willing to help by providing land.

Response (Houghton): This would be a good example to discuss among the group.

Question (Public): What will the data collection process be?

Response (Ono): We will contact various departments within the City & County, State, and Federal governments in addition to UH and other research institutions to try to find available data. We are not tasked with creating new data in this project.

Question (Alameida): Will the Core Working Group be able to recommend regulatory changes?

Response (Houghton/Ono): Yes. If current regulations are determined to be a barrier to progress, then the plan could contain recommendations.

Comment (Leinau): As part of the Wastewater 101 lesson at the next meeting, there should be an overview of current regulations.

Response (Ono): We can accommodate that.

Comment (Pahinui) (Hard copy comment submitted to project team prior to departing meeting): Need to get water quality guidelines into the plan for baseline information. If appropriate data is not available, need to request a study if needed.

Comment (Pahinui) (Hard copy comment submitted to project team prior to departing meeting): The plan is meant for current community residents, and not to promote or aid development.

Comment (Pahinui) (Hard copy comment submitted to project team prior to departing meeting): The plan's wastewater alternatives are very important and should address sustainability needs, especially agriculture

Draft Guiding Principles for the Plan: (Leland Chang)

Guiding principles are fundamental statements of community values that will guide our discussions and actions on this project.

Leland presented a draft set of statements that were developed from interviews with CWG members, a review of the NSSCP and NB minutes, and the report of the NSWWTF. Action is not being requested today. The guiding principles will be worked on with CWG input between now and the next meeting and brought back to the group. A worksheet will be sent to the CWG with a November 9th return date. The team will develop a next draft based on the comments received, for consideration and hopefully adoption at the next meeting.

Comment (Fomin): Draft guiding principles appear to encompass what the Wastewater Task Force came up with, which is greatly appreciated.

Next Steps

- CWG to review and comment on the draft Guiding Principles, which will be revised for CWG consideration and action at the next meeting.
- Next meeting will continue orientation to wastewater (Wastewater 101).
- An introduction to scenario planning will be presented.

Comment (Dilcher): Believes we need to look at the plans for Turtle Bay and how it will affect the North Shore region. We should at least contact someone from Turtle Bay and have them at our meetings.

Response (Houghton): The project team will discuss the possibility of incorporating a Turtle Bay perspective as part of the planning process.

Comment (Matsushima): Believes we should include Reed Matsuura and Laura Figueira in the CWG.

Response (Chang/Ono): We will invite them into the group if no one objects. There were none.

Comment (Miller): Believes we should include other areas outside the Neighborhood Board boundary such as Wahiawa and Lake Wilson to see how issues there impact the North Shore.

Comment (Leinau): Would like to see website resources emailed to the group.

Comment (Dilcher): Would like to see outhouses at Laniakea Beach.

Comment (Ono): PowerPoint presentation will eventually be available on City’s website.

Next Meetings

Next meeting scheduled for Tuesday, Nov. 27th with a 7:45 a.m. sign-in and 8:00 a.m. start. The meeting will last two hours. Location to be determined.

Other Comments

Comment (Haverly): All questions and concerns he had about the planning process were satisfactorily addressed today. He appreciates the open nature of the process.

**NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting II
November 27, 2007
Haleiwa Joe's Seafood Grill
66-011 Kamehameha Hwy.
Haleiwa, HI 96712**

**Meeting Summary
2/12/08**

CWG Members Present: Marianne Abrigo, Jeff Alameida, Cathy Aoki, T. Dilcher, Judy Fomin, Kalani Fronda, Ed Gonzales, Josh Heimowitz, John Hirota, Susan Lau, Joe Lazar, Marianita Lopez, Mike Lyons, Susan Matsushima, Reed Matsuura, Gerry Meade, Antya Miller, Edith Ramiscal, Mark Takemoto

CWG Members Absent: Diane Anderson, Jimmy Awai, Jr., Laura Figueira, Bob Leinau, Blake McElheny, Kathleen Pahinui, Randy Rarick, Warren Scoville, Ron Valenciana

Project Team Present: Leland Chang, Ron Crites, Tim Houghton, Darin Izon, Peter Ono, Audrey Uyema Pak

Also Attending: Lisa Izumi

Welcome and Introductions

Leland Chang extended his welcome and asked the CWG members to introduce themselves and state their organizational affiliation or primary activity. Project team members introduced themselves. Leland then reviewed the meeting agenda and moved to the first topic of discussion.

Finalizing CWG Meeting I Summary & Revised Guiding Principles

Leland asked CWG members if there were any major changes needed to the Meeting I Summary dated Oct. 19, 2007. No changes were suggested and the summary will be finalized and posted on ENV's website.

Leland asked CWG members for discussion of the revised Guiding Principles (GPs). A number of comments followed:

Comment (Frona): GP "C" should be amended to include that the NSRWWAP will be "aligned with growth as defined sub-regionally, specifically in regards to Community Development Plans (CDPs)."

Comment (Frondda): GP “H” should include a definition of what low-income is.

Response (Matsuura): Low-income is defined as 80% of median household income.

Comment (Alameida): In GP “B,” the corollary principle should be broken out into its own principle and reworded to state that the NSRWWAP shall promote options for increasing conservation, reclamation, and reuse of wastewater.

Leland asked CWG members if the group could agree on the Guiding Principles, including the proposed revisions. The group concurred and the Guiding Principles will be finalized and distributed.

Wastewater 101 Presentation: (Ron Crites – Brown and Caldwell)

Outline:

- I. Science of Wastewater Treatment
 - A. What is Wastewater
 - i. Greywater – water from kitchen, laundry, and shower areas
 - ii. Blackwater – water from toilet flushes
 - iii. Also includes commercial sources like restaurants
 - iv. It does not include stormwater or outside wash water
 - B. Why Treat Wastewater
 - i. Protect public health
 - ii. Protect drinking water quality
 - iii. Protect groundwater quality
 - iv. Make beneficial reuse of water
 - v. Avoid surface water pollution
 - C. Harmful Constituents in Wastewater
 - i. Pathogens
 - ii. Toxics
 - iii. Solids
 - iv. Organics
 - v. Nutrients
 - D. Disposal Methods
 - i. Cesspools
 - ii. Septic tanks and leach fields
 - iii. Injection wells
 - iv. Below ground reuse
 - v. Above ground reuse
 - vi. Ocean or lake outfall
 - E. Regulatory Framework
 - i. U.S. EPA – primary authority over nation’s water programs
 - ii. Hawaii State Dept. of Health – local entity responsible for regulating wastewater treatment, disposal, and reuse

- iii. City & County of Honolulu – owns, operates, and maintains all municipal wastewater facilities
 - II. What Wastewater Systems Exist on the North Shore
 - A. Study in 1992 estimated 3,152 cesspools in the North Shore, with about 40% failing
 - B. Since then, some have upgraded to septic tank – leach field systems
 - C. 31 private wastewater systems on the North Shore
 - i. 19 in Waialua
 - ii. 6 in Haleiwa
 - iii. 6 in Sunset/Pupukea
 - D. Paalaa Kai WWTP – constructed in 1980, it serves 314 homes
 - III. Alternative Technologies
 - A. Collection Systems
 - i. Conventional sewers
 - ii. Small diameter collection systems
 - iii. Pressure and vacuum sewers
 - B. Treatment Technologies
 - i. Greywater treatment systems
 - ii. Septic tanks
 - iii. Textile biofilters
 - iv. Membrane bioreactors (MBR)
 - v. Small community systems
 - vi. Example of Decentralized System – Stonehurst Wastewater System (Martinez, CA)
 - vii. Natural systems
 - 1. ponds
 - 2. constructed wetlands
 - 3. sprinkler irrigation
 - 4. soil adsorption systems
 - 5. soil aquifer treatment
 - IV. Management Approaches
 - A. Existing Systems Can be Sustained by Good, Consistent Management
 - B. Homeowner Awareness and Education
 - C. Onsite Management Districts
 - D. County Service Areas
 - E. EPA Management Models

-End

Question (Miller): Is there a City ordinance that restricts greywater usage?

Response (Houghton): I will check on that.

Question (Miller): You mentioned that Schofield has an MBR facility. Why then does it smell so bad by the bridge on Wilikina Drive near Schofield’s McCornack Gate?

Response (Houghton): A study was done about 3 years ago that found the smell was due more to natural marsh biodegradation processes rather than wastewater effluent discharges.

Question (Alameida): About how much longer do you think the Paalaa Kai treatment plant will last?

Response (Ono): It depends, but typically the design life of concrete structures in wastewater treatment plants is 50 years. The metal components of the treatment plant deteriorate much faster than the concrete structures. The maintenance of the plant has a big influence on the plant's useful life. If it's been well maintained, it could last another 20 years.

Question (Dilcher): What is a ballpark cost for upgrading a cesspool?

Response (Crites): \$8,000 to \$10,000 for septic tanks with leach fields. It also depends on the situation, such as the amount of land available. For more technological upgrades, it could be more like \$12,000 to \$15,000. These are material costs only.

Comment (Lyons): It is difficult for homes with small lots to upgrade because there is simply no room.

Comment (Gonzales): The State requires 10,000 square feet for upgrading systems on CPR properties.

Comment (Matsuura): It is important to consider what the optimization point is for each technology. You need to determine what the expected number of existing and future customers will be to a system and make sure the technology fits appropriately.

Question (Fomin): Has the Paalaa Kai treatment plant reached its capacity?

Response (Houghton): Yes. He believes the capacity is 100,000 gallons per day.

Question (Matsushima): Are there grants or other funding available to help with natural systems like wetlands?

Response (Houghton): Yes. There are different options that can be explored. One strategy is a private/public partnership. This was done with the Laie treatment plant. There are also examples of private operations and maintenance, such as Hawaii Kai.

Question (Fomin): Regarding Laie, what is being done for the new homes that are scheduled to be built up there?

Response (Houghton): The Laie plant has the capacity built into it to accommodate the planned future homes in the area.

Question (Alameida): If cesspool failures are sometimes structural, can the situation be alleviated by dealing with the solids before they have time to deteriorate the structure and its function?

Response (Crites): Yes. Routine maintenance is critical. All cesspools should be pumped periodically to avoid solids build up and potential problems. A maintenance and management education program should be part of the solution to the North Shore's wastewater issues.

Comment (Lyons): The City uses a lot of ferric chloride to treat odor problems. This chemical is very dangerous. The North Shore community should not support the use of this chemical.

Comment (Matsuura): Installing small individual units is fine, but one important thing to remember is that if the City constructs a wastewater collection system nearby, residents in the area must connect by ordinance.

Comment (Gonzales): From his experience, the biggest reason why cesspools fail is because they are out of sight, out of mind. The rule of thumb for wastewater generation is that a 5-BR house requires 1,000 gallons per day capacity. Sometimes the number of people that live in a house indicates that their cesspool is undersized. Regarding chemicals, his company uses sulfuric acid to help treat cesspools.

Comment (Matsushima): One wastewater treatment technology the group should look into is at the 4 Seasons Resort Hualalai on the Big Island. Part of the process actually involves growing fish for use in the restaurant.

Comment (Fomin): We need to remember that the North Shore has different sub-regions, and no single technology is appropriate for every sub-region.

Question (Takemoto): Do solids in wastewater breakdown at all, or do they just build up? How can you get rid of them?

Response (Crites): It depends on what the solids are made of. Most organic matter can be decomposed naturally through biodegradation processes, whereas some inorganic matter does not degrade and can accumulate. There are different treatment processes that can be used to remove both organic and inorganic solids.

Question (Takemoto): In comparison to the Paalaa Kai treatment plant that treats 100,000 gallons a day, about how much land would be needed if this amount was treated in some kind of natural system?

Response (Crites): It depends on a number of things, including soil type. If the soil is good, it would probably take about 1 acre.

Question (Miller): Are composting toilets allowed by the City, and are they a good technology to consider for the North Shore?

Response (Houghton): He will check the regulations.

Response (Crites): Composting toilets do require more dedicated maintenance and effort on the homeowner's part.

Comment (Fronza): Keep in mind that there is some cost associated with composting toilets.

Comment (Alameida): He did some costing estimates, and found that passive composting toilets ran about \$800, while higher tech options with electrical components ran about \$1,200.

Question (Fomin): Once this project is done, how soon is the City going to act on it?

Response (Houghton): We can't say at this point. No money has been allotted because we haven't identified specific projects yet. Once projects are recommended, they can start allocating funds to it and move forward with the process.

Comment (Matsuura): Wastewater projects are funded by the people who will be served by them. The City can borrow money to build these projects, then recoup the money in the future through service fees.

Comment (Gonzales): The North Shore should stay away from City-run facilities because sewer fees will just continue to go up

Question (Miller): Is the City required to operate wastewater systems?

Response (Houghton): There is no mandate that says the City must run a wastewater system. There are examples of private entities that operate and maintain these systems.

Comment (Fronza): You can also establish a public/private partnership agreement.

Comment (Chang): It's good that the group is starting to think about issues that will be discussed in CWG Meeting 3. Keep in mind that this is just the start of Wastewater 101, and that more information will be provided as we go along.

Next Steps

- Scenario Planning – During CWG Mtg. #3, everyone will take part in group exercises in scenario planning, which will involve brainstorming to come up with a broad range of approaches and strategies to realize the visions contained in the different scenarios.
- Homework – Please submit by Dec. 11, 2007.
- CWG meeting info can be found on ENV's website:
<http://www.co.honolulu.hi.us/env/usefuli.htm>
- The project team will continue its research on determining existing environmental conditions and will compile baseline data on the North Shore.
- CWG Mtg. #3 is tentatively scheduled for Tuesday, January 22, 2008.

**NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting III
January 22, 2008
YMCA – Camp Erdman
69-385 Farrington Hwy.
Waiialua, HI 96791**

**Meeting Summary
3/14/08**

CWG Members Present: Marianne Abrigo, Ed Gonzales, Josh Heimowitz, Bob Leinau, Marianita Lopez, Gerry Meade, Antya Miller, Kathleen Pahinui, Mark Takemoto

CWG Members Absent: Jeff Alameida, Diane Anderson, Cathy Aoki, Jimmy Awai, Jr., T. Dilcher, Laura Figueira, Judy Fomin, Kalani Fronda, John Hirota, Susan Lau, Joe Lazar, Michael Lyons, Susan Matsushima, Reed Matsuura, Blake McElheny, Edith Ramiscal, Randy Rarick, Warren Scoville, Ron Valenciana

Project Team Present: Leland Chang, Darin Izon, Peter Ono

Also Attending: Lisa Izumi, Les Young, Harold Nagato, Thomas Shirai

Welcome and Introductions

Leland Chang extended his welcome and introduced himself along with the project team members that were present. He then asked the CWG members to introduce themselves. Guests were also in attendance and were asked to introduce themselves. Leland then reviewed the meeting agenda and moved to the first topic of discussion.

Finalizing CWG Meeting II Summary

Leland asked CWG members if there were any major changes needed to the Meeting II Summary dated Dec. 18, 2007. No changes were suggested and the summary will be finalized and posted on ENV's website.

Scenario Planning Exercise

Leland described the purpose and objective of the Scenario Planning exercise. Three groups were formed between CWG members and guests. The following four scenarios based on NSRWWAP ideals were presented:

1. **Ahupua'a Vision** – In 2025, the North Shore Wastewater system embodies the concepts and principles of the ahupua'a:
 - A Native Hawaiian system of land division and resource management based on self-contained and geographically bounded areas from the mountain to the sea
 - Full community responsibility and involvement in protecting the resources in the area and using resources in a sustainable way
 - Rules for proper behavior regarding the use and protection of resources (kapu)
 - Living in harmony with nature
 - Highest value on protection of water resources as essential to life
 - A holistic view of resource management in the area, of which wastewater management is an integral part

The system serves the area's ahupua'a in its regional distribution of services and facilities and environmentally sustainable practices.

2. **Maximum Water Reclamation** – By 2025, reclaimed water is commonly used to irrigate and sustain diversified agriculture, landscaping of public and private property, and industrial uses. Further, the community is actively exploring ways to increase the use of reclaimed water.
3. **Minimum Financial Burden on Homeowners and Businesses** – By 2025, the necessary upgrades and improvements to the North Shore Wastewater System were achieved with the least possible amount of financial hardship on North Shore homeowners and businesses. For comparison purposes, the typical residential sewer fee is about \$43 per month plus \$1.80 per 1,000 gallons over the base 2,000 gallon per month allowance. The cost of properly maintaining a residential cesspool is estimated at \$150 per year for pumping.
4. **Zero Tolerance for Negative Environmental Impacts** – In 2025, the North Shore's wastewater systems, facilities and equipment do not contribute in any way to the degradation of the area's land, waters, and air; and meet all related Federal, State and County regulations. Further, the community is strongly encouraged to protect and restore the environment in matters related to the wastewater system.

Each group engaged in a brainstorming session and identified what they felt were possible strategies and actions that could assist in achieving the scenario in question. See the Scenario Planning input summary for results of this exercise.

Next Steps

- The project's first public community meeting is tentatively scheduled for the first week of April.
- The next CWG meeting is tentatively scheduled for May 6th.
- CWG members who were unable to attend this meeting will be asked to complete the Scenario Planning exercise as homework.
- The project team will continue its research on determining existing environmental conditions and will compile baseline data on the North Shore.

**NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting IV
February 23, 2010
Haleiwa Joe's Seafood Grill
66-011 Kamehameha Hwy.
Haleiwa, HI 96712**

**Final Meeting Summary
5/24/2010**

CWG Members Present: Marianne Abrigo, Kalani Fronda, Ed Gonzales, Susan Lau, Bob Leinau, Mike Lyons, Garrett Matsunami, Antya Miller, Kathleen Pahinui, Randy Rarick

CWG Members Absent: Jeff Alameida, Laura Figueira, Judy Fomin, John Hirota, Joe Lazar, Susan Matsushima, Reed Matsuura, Gerry Meade, Edith Ramiscal, Mark Takemoto, Ron Valenciana

Project Team Present: Leland Chang, Tim Houghton, Darin Izon, Peter Ono

Also Attending: Chad Adams

Agenda Item I: Welcome & Introductions

Tim Houghton of the City Department of Environmental Services extended his welcome and thanked the CWG members for their continued support of the NSRWWAP project despite the nearly two-year hiatus. He explained that the loss of funding from the State Department of Land and Natural Resources was the reason for the delay, but that the City was able to acquire internally the additional funding necessary to bring this project to completion. He turned the floor over to Leland Chang to commence with the meeting.

Agenda Item II: Orienting to Where We Have Been and Where We Are Going

Leland reviewed the Re-orientation Summary dated February 17, 2010 that was emailed to CWG members prior to today's meeting. Contained in the Re-Orientation Summary are the following:

- Background of the NSRWWAP project
- Purpose of the CWG
- Progress to date including descriptions of the first three CWG meetings
- Descriptions of future CWG meetings

Leland then asked those present to introduce themselves, state their affiliation(s) with the North Shore, and describe one happy event in their lives that has occurred during the project's hiatus.

Abrigo: Affiliation is with North Shore Chamber of Commerce and with real estate through Marianne Abrigo Properties. She sees a lot of cesspool and septic tank inspections because of her real estate work.

Alameida (absent): Because Jeff was not present, Leland stated that Jeff's affiliation is with the community development organization, Empower Oahu.

Figueira (absent): Because Laura was not present, Leland stated that Laura's affiliation is with Senator Bobby Bunda's office.

Fomin (absent): Because Judy was not present, Leland stated that Judy's affiliation is with Representative Michael Magaoay's office.

Frona: Affiliation is with Kamehameha Schools, which owns extensive property on the North Shore. The Kamehameha Schools North Shore Plan was completed in '08. The plan includes a number of projects that will have a long timeline of implementation. Kalani invited Chad Adams to the meeting. Chad is from Bio-Logical Capital, a company that is collaborating with Kamehameha Schools in implementing the North Shore Plan. They are interested in infrastructure and other aspects of the plan.

Gonzales: Affiliation is with wastewater systems through his business, Gecko Enterprises. Ed states that business is good, and he's been able to buy a nice piece of property on the North Shore.

Hirota (absent): Because John was not present, Leland stated that John's affiliation is with the North Shore Neighborhood Board and the Waiialua Community Kitchen.

Lau: Affiliation is with First Hawaiian Bank in Haleiwa. She's happy that her daughter obtained her PhD during the hiatus.

Lazar (absent): Because Joe was not present, Leland stated that Joe's affiliation is with the restaurant we are meeting in, Haleiwa Joe's.

Leinau: Bob's many affiliations include the North Shore Neighborhood Board, Defend Oahu Coalition, Outdoor Circle, Malama Pupukea, and North Shore Community Land Trust. He's also retired from working at Waimea Valley. He's happy to be taking a master gardener's class.

Lyons: Affiliation is with the North Shore Neighborhood Board (Chair). He is happy in his retirement. He's decided to run for State Senate. His wife is still in real estate. During the hiatus, he and his wife celebrated their 40th wedding anniversary; his daughter is expecting her 3rd child; and his mom received a living legend award.

Matsunami: Affiliation is with Castle & Cooke. Mark Takemoto has left the company and Garrett is taking his place as Castle & Cooke's representative on the CWG. Garrett used to be with the Board of Water Supply and knows Peter Ono through professional engineering organizations. He's also worked with wastewater on the mainland.

Matsuura (absent): Because Reed was not present, Leland stated that Reed's affiliation is with Councilman Donovan Dela Cruz' office.

Meade (absent): Because Gerry was not present, Leland stated that Gerry's affiliation is with the North Shore Neighborhood Board. She is also of native Hawaiian descent and brings the knowledge of the Hawaiian culture to our planning process.

Miller: Affiliation is with the North Shore Chamber of Commerce. During construction of the new Chamber building next to the Haleiwa Gym, she learned about the current regulations regarding upgrading large capacity cesspools.

Pahinui: Affiliation is with the North Shore Neighborhood Board. She is also active with the Waialua Community Association and works in advertising with Laird Christianson. She stated how important it is to develop a plan for appropriate wastewater treatment on the North Shore.

Ramiscal (absent): Because Edith was not present, Leland stated that Edith's affiliation was with the Waialua Farmers Cooperative. Although she is no longer with the coop, she brings knowledge of agricultural interests on the North Shore. He believes she now works at Schofield as a teacher.

Rarick: Affiliation is with surfing and ocean resources. This past season was a big success since in addition to the Triple Crown events, the Eddie Aikau Quicksilver also took place bringing a lot of exposure to the State. A green program was implemented for these events that targeted zero waste generation. Approximately 2.5 tons of water bottles were recycled. In the past, bathroom facilities have overflowed at Ehukai. To avoid overloading facilities, they encouraged people to view the Triple Crown events online.

Takemoto (absent): Because Mark was not present, Leland stated that Mark's former affiliation was with Castle & Cooke. He now works for Pioneer Hi-bred and represents agricultural and land use interests on the North Shore.

Agenda Item III: CWG Input on Recent Events with Potential Implications for North Shore Wastewater Planning

Leland asked CWG members for their input on events that have occurred during the project hiatus that may impact the wastewater planning effort. Following are their responses:

Miller: The Kamehameha Schools North Shore Plan is a very important document that needs to be considered within the wastewater planning effort.

Frona: The Kamehameha Schools North Shore Plan includes significant renovations at Haleiwa Town Center and North Shore Marketplace. Plans for the North Shore Marketplace include adding 2 new lessees and increasing the square footage of commercial space. This may require modification to the existing wastewater system there. The Matsumoto's Shave Ice building will start renovations in a projected 3 to 5 years.

Gonzales: Ed asked Kalani if the modifications to the existing wastewater system at North Shore Marketplace would be in addition to what was already done, since his company recently completed a new wastewater installation there. Kalani responded that the proposed development may very well require additional wastewater treatment expansion.

Leinau: The number of visitors to the North Shore continues to increase. Just because there aren't any public bathroom facilities in an area doesn't mean that people don't go. Facilities are needed to accommodate these visitors. Potential sites for wastewater facilities include:

- Livestock experimental station at Waiale'e. The UH College of Tropical Agriculture and Human Resources (CTAHR) is looking to vacate the property. The land belongs to the State. Area is adjacent to Velzyland and could be turned into a park.
- Sunset Beach. There could potentially be sites around Sunset Beach that could accommodate wastewater facilities.
- Turtle Bay. It may be possible to hook up to the existing Turtle Bay Wastewater Treatment Plant.

Someone asked about the wastewater plant at Waimea Valley. Bob stated that it was a self-contained system that serves only the park facilities.

Pahinui: There may be possible reuse opportunities for Aloun Farms in the future.

Leinau: There is a new subdivision going in near Pukea Road that is part of IBEW land. The site is located on low-percolation soil. Ed Gonzales is helping to design the IWS to discharge to a fracture zone.

Lyons: Phycal is looking to develop algae farms on the North Shore for fuel. There are estimates out there that say they could use up to 5,000 acres which would require about 1 million gallons per day of water. Also, Leilehua Golf Course will likely be closing to make room for more housing. This will require lots of water, and these two examples could be reuse candidates. There is also talk of one of the public schools closing down on the North Shore. This indicates fewer families moving to the area, and a heavier reliance on visitors.

Agenda Item IV: Adding to Scenario Planning Results from CWG III

Since attendance at CWG III (held on Jan. 22, 2008) was low, Leland asked CWG members for additional input on the important issues that were discussed during the Scenario Planning exercise at the meeting. Following are members' comments:

- *Scenario: Minimum Financial Burden*

Miller: There should be exemptions to sewer upgrades for businesses or individuals who have already upgraded and spent a lot of money to comply with current regulations.

Leinau: Current regulations require that people hook up if there's a municipal sewer nearby. Explore exemptions across the board especially for those who live far from where systems would be built. Hooking up would be very expensive.

Pahinui: In order to avoid everyone claiming exemptions, there needs to be established, detailed criteria for what qualifies for an exemption.

Houghton: Laie is a good example where one person did not want to connect to the new sewer. After everything was put in he changed his mind and wanted to connect. This would have required installing a line under Kamehameha Hwy, and would have cost him around \$40,000.

- *Ahupua'a Vision*

Leinau: Someone who comes from a native Hawaiian background should be the CWG lead on the Ahupua'a vision. Perhaps Kalani or Gerry would be good candidates.

Frona: Prefers that Gerry or someone similar take the lead on Ahupua'a vision.

- *Maximum Water Reclamation*

Miller: We should explore water reclamation for agriculture.

Agenda Item V: Regional Data and Other Related Planning Information

Darin presented the methodology that will be used to gather regional data and planning information for use in this study. Topics of discussion can be found in the PowerPoint slides contained in Appendix B.

Comments that arose during Agenda Item V are as follows:

Gonzales: Disagrees with statement that private systems in Cement City are poorly maintained. Most have service contracts that include routine maintenance. The State also oversees these facilities. Those with aerobic treatment require a licensed operator. The typical method of effluent disposal is injection wells. There are known to be mild odors.

Leinau: Do we know what's going on with ocean water quality as related to cesspools? A number of people have asked for data. If not available, we should commission someone to do some testing before spending a lot of effort on this study.

Pahinui: This wastewater alternatives plan shouldn't be held up to wait for ocean testing. We have systems that are failing now. More and more visitors are expected each year, so we have to establish this plan to help guide the direction of wastewater planning in the future.

Agenda Item VI: Initial Discussion of Evaluation Criteria

Leland asked the group to brainstorm ideas on evaluation criteria that should be used to evaluate various wastewater alternatives. Following are the group's responses:

- Dollars/Cost
- Minimum negative environmental impact
- Maintenance fees/Simplicity of design
- Final water reuse potential/Maximum reuse potential
- Land required/Footprint
- Aesthetic impact
- Maximum capacity
- Green design
- Expandability
- Life expectancy
- Soil compatibility/Percolation
- Employment to maintain facility
- How many waste systems are we willing to deal with
- Odors
- Enforcement/Management
- Safety/Redundancy/Reliability
- Fundability
- Expense to rate payers or tax payers
- Ability to qualify for tax incentives

Agenda Item VII: Next Steps and Next Meeting

Evaluation criteria will be refined and used in a pairwise comparison exercise to develop relative weightings. The technical team will continue to gather regional data and community information. This process will require extra time between meetings. The next CWG meeting will be a couple of months from now.

Agenda Item VIII: Public Comments

There were no comments from the public.

**NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting V
May 20, 2010
Haleiwa Joe's Seafood Grill
66-011 Kamehameha Hwy.
Haleiwa, HI 96712**

**Final Meeting Summary
8/16/2010**

CWG Members Present: Marianne Abrigo, Laura Figueira, Judy Fomin, Ed Gonzales, John Hirota, Susan Lau, Joe Lazar, Bob Leinau, Antya Miller, Kathleen Pahinui, Randy Rarick, Mark Takemoto

CWG Members Absent: Jeff Alameida, Kalani Fronda, Mike Lyons, Susan Matsushima, Reed Matsuura, Gerry Meade, Edith Ramiscal, Mark Takemoto, Ron Valenciana

Project Team Present: Leland Chang, Tim Houghton, Darin Izon, Elizabeth Ngo, Peter Ono

Agenda Item I: Welcome & Introductions

Leland Chang greeted the group and went over the meeting agenda. He asked if members had a chance to go over the draft CWG IV meeting summary and if they had any comments or questions prior to it being finalized.

Comment (Leinau): Bob stated that he likes the meeting summaries that are produced after each meeting. He asked if there was a process by which the City and consulting team review any issues, questions, or comments that are contained in the summaries which can then be resolved and pertinent information distributed to the CWG members. He also asked if the draft summaries can be sent out well in advance of the next meeting so members have ample time to review them.

Response (Chang): Leland stated that the team tries to address these issues within the final summaries themselves, or if it takes longer to resolve they might discuss the issue at the next meeting. Ultimately, all findings should be documented in some fashion and be submitted to the City for posting on the ENV website. Leland agreed that members should be given ample time for review of project material.

Leland stated that the bulk of the CWG V meeting was going to be dedicated to Agenda Item II – Regional Wastewater-related Data and Community Information. Since there were no further questions on the CWG IV draft summary, Leland turned the floor over to Darin Izon.

Agenda Item II: Regional Wastewater-related Data and Community Information

The information that was covered during Agenda Item II is contained in the PowerPoint presentation that accompanies this meeting summary. Throughout the presentation, a number of questions, comments, and discussions were brought up. These are summarized as follows:

Discussion (Izon): Darin mentioned that the scope of this project does not involve the creation of new data, which means that environmental sampling and analysis will not be conducted. This project instead looks at existing data to develop a baseline of current conditions in the region. Darin referenced the recently completed Kaiaka Bay Watershed Participatory Assessment and Action Project. Sampling efforts for that project showed elevated levels of nitrates, phosphates, and metals in certain areas. Darin read through some meeting minutes where Dr. Russell Yost of the UH College of Tropical Agriculture and Human Resources (CTAHR) stated that some contamination could be from failing wastewater systems in the upper portions of the watershed. Darin wasn't sure if there was any definitive correlation linking failing wastewater systems to the contamination found in this study.

Response (Pahinui): Kathleen stated that the report from this study is finalized and should be downloadable off the internet. She said she would try to obtain a copy of the report.

Comment (Ono): Peter stated that it would be difficult to determine a direct link between cesspools and downstream contamination since it would involve non-point sources. This would involve costly, detailed studies.

Discussion (Izon): Darin referenced the 2005 State DOH Groundwater Contamination Maps that show 9 known contaminated wells (pesticides/herbicides/solvents) within the North Shore Neighborhood Board region, more specifically in the Waialua and Haleiwa sub-districts.

Question: A question was asked as to what type of wells these were.

Response (Izon): Darin responded that the wells in these two sub-districts are mostly agricultural/irrigation wells.

Question (Leinau): Bob asked if the USGS was conducting any monitoring in the North Shore area.

Response (Ono): Peter responded that they may be doing some monitoring, but it isn't wastewater related.

Response (Izon): Darin responded that the USGS was involved in a study in West Maui that attempted to study the impacts that wastewater effluent disposal through underground injection wells had on coastal zone water quality. An article can be found in the May 2010 issue of Environment Hawaii.

Discussion (Izon): Darin referenced the 1992 wastewater report done by Parametrix, Inc. that estimated 3,152 cesspools in the region with 40% failing.

Question: A question was asked as to what determines a failed cesspool.

Response (Gonzales): Ed responded that if a cesspool needs to be pumped more than once a year, it's considered failed.

Comment (Miller): Antya commented that the cesspool numbers appear low.

Response (Houghton): Tim responded that the numbers get lower with time since no new cesspools are being permitted. Schools with large capacity cesspools have been upgraded per an EPA requirement, and parks are pending.

Comment: A comment was made that some of the names used to describe certain areas were inaccurate. "Cement City" in Waiialua should be referred to as the "Aweoweo Beach" area. Also, "Waimea Valley Audobon Center" is now just called "Waimea Valley."

Question (Leinau): Bob asked what the change in treatment effectiveness is when you upgrade from cesspools to septic tanks to aerobic systems, etc.

Response (Ono): Peter responded that basically cesspools provide very little treatment. There is some solids removal and along with that some BOD removal, it is more of a disposal system. Septic tanks are designed to capture solids and provide BOD reduction, therefore providing actual treatment of the wastes before going to the disposal system.

Response (Gonzales): Ed responded that he sometimes adds filters to the discharge pipe of septic tanks in order to reduce the solids that can go into the disposal system. You just need to change out the filters periodically.

Question (Lazar): Joe asked what kind of treatment is best for places that are located right by the water table?

Response (Gonzales): Ed responded that those areas should probably have some sort of aerobic system.

Comment (Gonzales): Ed commented that the Paalaa Kai WWTP used to be a tertiary plant at one time, but the effluent numbers were so good that the City reduced it to a secondary plant which still met effluent quality requirements.

Question (Leinau): Bob asked what the typical shelf life of a WWTP is.

Response (Izon): Darin responded that treatment plants are usually designed for a 50-year life.

Discussion (Izon): Darin stated that the wastewater solids collected in the North Shore region are hauled to Kahuku or Honouliuli wastewater plants.

Question (Leinau): Bob asked what constitutes “solids”?

Response (Ono): Peter responded that in this case the solids he is referring to would be sludge from small plants and pumpage - what is pumped from cesspools and septic tanks.

Discussion (Izon): Darin stated that there is no direct wastewater effluent reuse in the North Shore region. Currently, effluent is reused indirectly through irrigation of agricultural lands with Lake Wilson water. Lake Wilson receives wastewater effluent from Wahiawa WWTP. Schofield also discharges effluent to the irrigation system used by North Shore agricultural lands.

Comment (Pahinui): Kathleen stated that Phycal is proposing to establish an algae farm on Galbraith land for the purpose of producing biofuels. An estimated 30 acres would be needed, which would use reservoir water from Lake Wilson. She also stated that Aloun Farms is going to establish farming on Castle & Cooke land.

Comment (Leinau): Bob commented that laws should be changed to allow greywater use for homes. Currently it is not allowed.

Response (Izon): Darin stated it was his understanding that the State had adopted greywater use guidelines and that the various Counties now allow the use of greywater.

Response (Houghton): Tim stated that the City would be open to greywater use, but that the DOH governs. Tim will confirm that the County now allows the use of greywater.

Discussion (Izon): Darin presented the latest population projections for the North Shore region. These were taken from the City Department of Planning. He stated that the population increases through 2030 appeared high. One thought was that DPP’s projections may have included the Paumalu area that was originally planned for development. This area was ultimately preserved, and therefore any population increase that may have been associated with this area should be eliminated.

Comment (Pahinui): Kathleen commented that the Sustainable Communities Plan originally included population projections that the community rejected. She stated that the consultant team should follow up to make sure the current projections are accurate.

Comment (Leinau): Bob commented that these numbers need to be looked at closely. He stated that Sunset/Pupukea should be handled in two separate sections. One should be at the higher elevations, and the other should be the lower areas around Kamehameha Hwy.

Question (Lazar): Joe asked if growth projections take tourism into account?

Response (Izon): Darin stated that the commercial estimates do account for some visitors because the City wastewater guidelines include more people per acre for commercial parcels.

Discussion (Izon): Darin presented some North Shore lands that are significant in size and are in a transition of ownership. It is possible that future wastewater facilities and/or effluent reuse opportunities could be sited on these parcels:

Waiale'e – CTAHR is moving its operation to another location. Some of this property is being transferred to the City for park land.

Mokuleia – portions of existing polo grounds. Not sure who currently owns this property, but articles have been researched that indicate possible development into an equestrian development.

Galbraith Trust property – A few parcels have been sold. Unknown what will happen to the rest of it. The Lake Wilson dam is now owned by Howard Green through his company Sustainable Hawaii.

Comment (Leinau): Bob commented that there may be land across from Kaiaka Park that might be available for future wastewater facilities.

Agenda Item III: Wastewater Alternatives Evaluation Criteria - Pairwise Comparison Activity

Leland introduced the concept of Pairwise Comparison. For the NSRWWAP project, we will utilize this concept to compare the various wastewater alternative evaluation criteria that the CWG identified at the last meeting. Each criteria will be compared against the others, which will result in a ranked list of the most important criteria that the CWG feels should govern the development of alternatives.

A spreadsheet of the Pairwise Comparison exercise was handed to each individual, and Leland asked them to complete the first few comparisons to get a feel for the exercise. He then asked them to take the exercise home as an assignment and to turn them in upon completion so the consultant team can use the information to assist with alternatives development.

Questions and comments followed:

Question (Miller): After we do the Pairwise Comparison exercise individually, are we going to review the results and do the exercise again as a group?

Response (Pahinui): It seems like the purpose of the exercise is to do it individually, not as a group.

Response (Lazar): People may have different levels of knowledge of these issues. Maybe if we discussed the criteria as a group first, we'd all have a better understanding and can compare the criteria better.

Response (Chang): It's ok if people have varying levels of understanding of a criteria. From my experience with Pairwise Comparison, the criteria that represent the community's values the most always seem to come forward in the end. You can always contact us with questions if necessary if you don't feel comfortable with the exercise. We will share the results of the exercise with the group once we have all the data compiled.

Agenda Item IV: Next Steps and Next Meeting

Leland asked the CWG members to complete the Pairwise Comparison assignment at home and submit them to the project team upon completion.

The next meeting (CWG VI) will probably take place in about two months. At this meeting, the project team will present specific wastewater alternatives for the region based on all the research and CWG input collected. After CWG VI or VII, we will have a general public meeting for the community to share what has been accomplished and what needs to be done to bring the project to completion. After the public meeting, we will likely have one more CWG meeting to wrap up the community engagement effort.

Agenda Item V: Public Comments

There were no comments from the public.

Agenda Item VI: Adjourn

**NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting VI
August 13, 2010
Haleiwa Joe's Seafood Grill
66-011 Kamehameha Hwy.
Haleiwa, HI 96712**

**Draft Meeting Summary
10/20/2010**

CWG Members Present: Marianne Abrigo, Kalani Fronza, Ed Gonzales, Trina Ishii (for Laura Figueira), Susan Lau, Joe Lazar, Bob Leinau, Mike Lyons, Susan Matsushima, Kathleen Pahinui, Randy Rarick, Mark Takemoto

CWG Members Absent: Judy Fomin, John Hirota, Garrett Matsunami, Reed Matsuura, Antya Miller, Edith Ramiscal, Ron Valenciana

Project Team Present: Leland Chang, Tim Houghton, Darin Izon, Peter Ono

Agenda Items I and II: Welcome & Introductions / CWG V Meeting Summary

Leland Chang greeted the group and went over the meeting agenda. He asked if members had a chance to go over the draft CWG V meeting summary and if they had any comments or questions prior to it being finalized. The group confirmed they had reviewed the draft and had no further comments on it.

Comment (Leinau): Bob stated that he still had not received the PowerPoint presentation from the previous meeting and requested that this be distributed to the group promptly.

Response (Chang): Leland stated that Brown and Caldwell would put a package together to send to the group, and that this package would contain the PowerPoint presentation from CWG V and VI.

Leland stated that the bulk of the CWG VI meeting was going to be dedicated to Agenda Items III and IV. Since there were no further questions on the CWG IV draft summary, Leland turned the floor over to Darin Izon.

Agenda Items III and IV: Conceptual Alternatives for the Region's Sub-districts / Preliminary Recommended Alternatives for Haleiwa Sub-district

See PowerPoint presentation for slides of topics discussed during these agenda items. Following is a summary of discussions that occurred during this part of the presentation:

Kathleen P.: Could we please have a brief explanation added to each of the alternatives in the toolbox?

Bob L.: Some of the criteria were not applicable in certain cases, e.g., tax incentives.

Darin I.: The team took that into account, for example, by grouping the cost criteria.

Kathleen P.: Do the planning guidelines for calculating flows take into account the added density from Sunset Beach vacation rentals?

Darin I.: For planning purposes, the guidelines are appropriately conservative.

Joe L.: Should estimates be based on Board of Water Supply figures?

Peter O.: That would be one way to do it.

Bob L.: What about rainy season water intrusion?

Darin I.: At present, we are using planning guidelines to help determine appropriate technologies and approaches. When it comes to actually designing the systems, more detailed estimates would be used.

Bob L.: Are we looking at land availability and acquisition for locating various systems?

Marianne A.: neighborhood densities are increasing as homeowners add on to their homes and more people move in.

Ed G.: North Shore Marketplace is considered the hub; currently system capacity is 50k gallons per day.

Darin I.; Brown and Caldwell estimate was 62k gallons per day.

Bob L.; Will it be possible to collect and send to multiple distribution points?

Peter O.: Team will eventually consolidate the areas and look at possibilities between subdistricts.

Joe L.: Having smaller systems will limit the negative effects when there are failures.

Bob L.: Will property owners run afoul of regulations if they lack sufficient land for a leach field (10k sq. ft.)?

Peter O.: Alternatives 1 and 2 can be melded; they are not mutually exclusive.

Bob L.: What are differences between vertical and horizontal flow wetlands?

Peter O.: Both provide same treatment but effluent still needs to be disposed.

Kathleen P.: Re. Alternative 4, what about aesthetics of alternatives?

Peter O.: Clusters are not for large flows but they are not very visible; there are compact systems.

Bob L.: What about expense to run these systems, e.g., filters and UV? Are there estimates of cost per 100k gallons to treat?

Peter O.; It depends on what quality of effluent you want; you may not need to treat to R1.

Ed G.: R2 would be more applicable.

Bob L.: Will North Shore residents pay for the City's settlement with the EPA?

Tim H.: No, not if they are not connected to City sewers.

Bob L.: Are there funds for new and experimental technologies?

Marianne A.: How would we know about new technologies being tried around the world?

Peter O.: These small systems are designed to be pretty simple and they are proven.

Darin I.: Alternative 6 - MBR provides good quality effluent; good opportunity for reuse.

Bob L.: Will plans consider possibilities outside the region?

Darin I.: Yes; GIS will influence alternatives.

Susan M.: Reclamation should be a focus; likes wetlands idea; \$4.2 million Dole demonstration wetlands project is just sitting there.

Kathleen P.: keep reuse focus on agriculture.

Tim H.: The City pays a fee for discharge on to private property.

Randy R.: Sunset-Pupukea -- nothing growing there.

Peter O.: There is a higher cost for producing recycled water.

Darin I.: The region wouldn't produce a high volume of recycled water because there's isn't a lot of development planned that would greatly increase the volume of wastewater generated.

Furthermore, wastewater generation is spread out through the region and not consolidated in one area. There would be high cost in consolidating all the recycled water in one place.

Kathleen P.: The project team should connect with the NB's ag committee.

Agenda Item V: Next Steps and Next Meeting

The next meeting (CWG VII) will probably take place in about three months. At this meeting, the project team will present specific wastewater alternatives for the region based on all the research and CWG input collected.

Agenda Item V: Public Comments

There were no comments from the public.

Agenda Item VI: Adjourn

**NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting VII
November 17, 2010
Waialua Community Association, Cottage #2
66-434 Kam Hwy.
Haleiwa, Hawaii 96712**

**Final Meeting Summary
5/4/2011**

CWG Members Present: Marianne Abrigo, Laura Figueira, Judy Fomin, Kalani Fronda, Ed Gonzales, Susan Lau, Bob Leinau, Garrett Matsunami, Susan Matsushima, Kathleen Pahinui, Mark Takemoto

CWG Members Absent: John Hirota, Joe Lazar, Mike Lyons, Reed Matsuura, Antya Miller, Edith Ramiscal, Randy Rarick, Ron Valenciana

Project Team Present: Leland Chang, Ron Crites, Darin Izon, Peter Ono

Agenda Items I and II: Welcome & Introductions / CWG VI Meeting Summary

Leland Chang greeted the group and went over the meeting agenda. He asked if members had a chance to go over the draft CWG VI meeting summary and if they had any comments or questions prior to it being finalized. The group confirmed they had reviewed the draft and had no further comments on it. They also confirmed receipt of the PowerPoint presentation from the previous meeting.

Leland stated that the bulk of the CWG VI meeting was going to be dedicated to Agenda Items III and IV. Since there were no further questions on the CWG IV draft summary, Leland turned the floor over to Darin Izon.

Agenda Item III: Review of Alternatives Selection Process (from CWG VI)

See PowerPoint presentation for slides of topics discussed during this agenda item.

Peter described the process of the CWG and reviewed all the guidance tools that it has given the project team in developing its alternatives. He indicated that perhaps two more meetings may be needed to wrap things up.

Ron described the Toolbox of Conceptual Alternatives noting that they were developed to cover the range of minimal infrastructure changes to significant changes with the Regional Sewering being the last of 10 alternatives in the toolbox. Ron described the revised ranking of alternatives.

Bob L. asked how much is the pairwise ranking weighted in forming recommendations, and how precise is the ranking?

Peter O. and Kathleen P. responded that as a planning tool the rankings were still based on subjective assignment of numbers to each item. It is mainly a guide to show the community's sentiment on proper direction/values.

Agenda Item IV & V: Recommended Alternatives for the Five Regional Sub-districts/Community and County Interaction on Future North Shore Wastewater Improvements

Darin described the alternative mapping process, provided flows by map and indicated the recommended alternatives as mapped for each of the 5 subdistricts.

Bob L. asked about the use of trees to maximize the evapotranspiration of water.

Ron C. estimated that a 30% increase over the typical 3,700 gpd/acre loading could be possible.

For the water reuse alternatives several people indicated that R-1 water would be preferred to maximize the flexibility of using different agricultural crops including food crops.

Kathleen P. reminded the group that we were focusing on opportunities rather than fixing single solutions and that a roadmap to potential reuse options was needed.

Kalani F. indicated that for the Kamehameha Schools' properties, R-1 water would be their preference and that additional lands adjacent to some of the residential areas could be irrigated if recycled water were available.

Bob L. questioned who buys the land.

Peter O. said that reuse could be on private land, but that a managing entity usually buys the land for the treatment plant.

Bob L. asked if sewers and treatment plants became part of the County, would the residents all be paying the same rate as the other residents in Honolulu?

Peter O. said yes.

Judy F. commented that it may be 15 to 20 years before the County would be able to implement significant sewerage on the North Shore.

Bob L. questioned Darin's flow and population figures for Kawaihoa and felt they were too high.

Darin I. responded that small changes in population and flow numbers likely wouldn't change the recommended alternatives for a given area.

Kalani F. indicated there may be more land mauka of the highway in Kawaihoa that could be considered for reuse.

There was discussion on the private SBR that exists at Waimea Bay.

Ed G. said it has a flow of around 5,000 gpd.

Bob L. asked Ed about the performance of cesspools in Pupukea.

Ed G. said they were typically 30 ft deep and that percolation was not a problem. He said that cave-in is an issue with some cesspools.

There was discussion of whether sewerage along the highway in Sunset Beach would be advisable, especially if a reuse area could be found.

Bob L. commented that a lot of homes along Kamehameha Hwy are very close to the ocean and water quality is a concern with cesspools. He asked for cost data for installing sewer lines in the street.

Everyone was appreciative of the maps that were handed out.

Agenda Item VI: Next Steps and Next Meeting

Regarding a public meeting in 2011, Kathleen P. said if we do a night-time meeting in conjunction with the Neighborhood Board meeting, it would have to be in March at the earliest.

Kathleen also suggested that BC draft the report for review by the CWG.

Agenda Item V: Public Comments

There were no comments from the public.

Agenda Item VI: Adjourn

**NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)
Core Working Group (CWG) Meeting VIII
May 4, 2011
Haleiwa Joe's Seafood Grill
66-011 Kamehameha Hwy.
Haleiwa, HI 96712**

**Draft Meeting Summary
6/8/2011**

CWG Members Present: Marianne Abrigo, Judy Fomin, Joe Lazar, Bob Leinau, Mike Lyons, Garrett Matsunami, Susan Matsushima, Reed Matsuura, Antya Miller, Kathleen Pahinui, Edith Ramiscal, Randy Rarick, Warren Scoville

CWG Members Absent: Laura Figueira, Kalani Fronda, Ed Gonzales, John Hirota, Susan Lau, Mark Takemoto, Ron Valenciana

Project Team Present: Leland Chang, Darin Izon, Elizabeth Ngo, Peter Ono

Guests: Will Schoettle (Standard Enterprises), Mike Wilson (Ace Pumping), John Borsa

Agenda Item I & II: Welcome & Introductions / CWG VII Meeting Summary

Leland Chang greeted the group and went over the meeting agenda. He asked if members had a chance to go over the draft CWG VII meeting summary and if they had any comments or questions prior to it being finalized. The group confirmed they had reviewed the draft and had no further comments on it. They also confirmed receipt of the PowerPoint presentation from the previous meeting.

Leland stated that the bulk of the CWG VIII meeting was going to be dedicated to discussing the NSRWWAP draft report. Since there were no further questions, Leland turned the floor over to Darin Izon and Peter Ono.

Agenda Item III: Review of Working Draft of the NSRWWAP

The following is a summary of comments, questions, and responses that were made while discussing the draft report:

Randy R.: Thanks for the electronic file.

Bob L.: Looks good. The NSSCP has been adopted

Antya M.: Concerned about the accuracy of some of the comments in the key interview notes.

Kathleen P.: These were the comments made by interviewees; we can add a qualifying statement that these were comments received and they may or not be accurate.

Bob L.: How do we move through either/or questions in trying to prioritize?

Peter O.: engineering needs to be done.

Bob L.: Re. the gpd allocations, is parks use shown?

Darin I.: This is hard to quantify but we will clarify this in the plan.

Reed M.: The info on parks is available.

Bob L.: If you cross check water use with wastewater flows, what is an ok amount of shrinkage?

Peter O.: About 60%

Bob L.: Re. allocations by area, what about de facto population (2 million visitors per year)?

Darin I.: Numbers are based on DPP population numbers (required in the contract with ENV).

Kathleen P.: Maybe this was talked about but it is not reflected.

Peter O.: We will take a look at this; perhaps look at shopping centers.

Mike L.: Does this consider other probable private developments?

Darin I.: Kamehameha Schools plans and DPP projections are included.

Reed M.: Agree with this re. Mokuleia -- thousands of acres that could be developed in the future.

Peter O.: DPP numbers are called for in the planning contract; as these change in the future, the plan can be adapted. Plus we aren't trying to size a large centralized plant; small decentralized systems can be expanded.

Reed M.: Concerned because of costs.

Peter O.: The plan isn't concerned with specifics re. cost.

Darin I.: We aren't designing or sizing systems with this plan; the proposed alternatives would still apply should there be more development in certain areas, like Mokuleia. But overall, there won't be a drastic change to the rural nature of the region.

Antya M.: Did we prioritize different areas? Pupukea would be the lowest priority.

Marainne A.: Not just prioritize by area but also by land classification -- commercial first, then residential.

Bob L.: Back to Reed's comments about costs, there should be more about funding scenarios and how costs will be billed; try to put people's minds at ease.

Peter O.: We still need to add something about costs but how costs will be billed needs to happen at the next level

Antya M.: This (the plan) will never get done. Rail will take priority for resources.

Reed M.: All City's costs (including bond costs) will be repaid by the users. ENV needs to let us know about the cost of the consent decree.

Peter O.: This doesn't have to be a City system.

Kathleen P.: Agree with Peter; e.g., KS won't let the City run its system. Have a section on costs but not in 2011 dollars. Any new plant will need to follow this plan and the SCP. Re. prioritizing, don't lock in at this point, i.e., commercial getting done first.

Bob L.: Section 5-3 does have cost implications; can we have some timeframes in there (e.g., one-time costs)?

Randy R.: Will the amount of wastewater going into the system change as more people use graywater?

Peter O.: DPP's numbers don't anticipate graywater use.

Antya M.: [comment re. different management models -- D.I. should have this in his notes]

Bob L.: Will any of this be compulsory? Also re. bacteria counts, it would be good to use more current numbers and document pollution where we can.

Darin I.: We will try to update this.

Reed M.: Re. private sewer lines, will connecting be compulsory?

Peter O.: Yes, this is a state requirement.

Judy F. E.g., Sunset Makai -- if sewerred, everyone needs to connect; can't imagine sewerred out there -- too much new development (new homes) to take care of.

Susan M.: CWG should recommend that City and State rules be in tandem, rather than have two different sets of protocols.

Darin I.: Don't need to be in tandem to implement this plan.

Peter O.: If you put in a City system, you will be in compliance with State requirements.

Antya M.: Re. two shopping centers -- there was talk about exempting them for a time; will report reflect this discussion?

Bob L.: Not just shopping centers; e.g., houses who install septic systems and then have to hook up to a larger system.

Agenda Item IV: Public Meeting Plans

- CWG members recommended that August be scheduled for the public meeting, and that the project team announce the meeting at the July neighborhood board meeting.
- The North Shore News was recommended as a means of advertising the public meeting as well.
- Leland asked CWG members if they would be willing to assist in facilitating at the public meeting, and all were receptive to the idea.
- Need to be mindful of Sunshine Law requirements and how they apply

Agenda Item V: Next Steps and Next Meeting

- Homework for CWG members is to provide comments on the working draft by May 27th.
- After the public meeting, we will likely have at least one more CWG meeting to conclude.

Agenda Item VI: Public Comments

Will Schoettle: What about developers who make their facilities accessible to the public? Do they get some kind of break?

John Borsa: Second Bob's comments re. new technologies. Why not use these?

Agenda Item VII: Adjourn and Aloha

NORTH SHORE REGIONAL WASTEWATER ALTERNATIVES PLAN (NSRWWAP)

Community Meeting

August 31, 2011

Waiialua Community Association

66-434 Kamehameha Hwy.

Haleiwa, Hawaii 96712

Meeting Summary

9/30/2011

CWG Members Present: Marianne Abrigo, Kalani Fronda, Bob Leinau, Reed Matsuura, Antya Miller, Kathleen Pahinui, Edith Ramiscal

Project Team Present: Tim Houghton, Executive Assistant – City Dept. of Environmental Services
Leland Chang, Principal – Project Consulting Services
Kyle Fooks, Engineering Intern – Brown and Caldwell
Darin Izon, Project Engineer – Brown and Caldwell
Peter Ono, Project Manager – Brown and Caldwell

Guests: Tammy Escorzon, Ellen Fooks, Karl Fooks, Melvin Kawalu, Maria Plottier, Will Schoettle, Steve Tuinbull

Tim Houghton gave a brief description of the North Shore Regional Wastewater Alternatives Plan Project and introduced the consultant team.

Agenda Item I: Welcome & Introductions

Leland Chang greeted the group and went over the meeting agenda. He asked everyone present to introduce themselves and state their interest in or affiliation with the North Shore community.

Agenda Item II: Presentations

Leland spoke about the Community Engagement Process that was implemented with the NSRWWAP. He acknowledged the members of the Core Working Group and described the methodology behind the CWG selection process. Leland then summarized the milestones that were reached after holding 8 CWG meetings and highlighted the major contributions the CWG made in helping the project team develop feasible wastewater alternatives for the North Shore.

Peter gave some background on the existing state of wastewater on the North Shore and discussed the “toolbox” of conceptual alternatives that were developed for improving the way wastewater is handled. He explained the pairwise comparison process that was used to rank these alternatives based on the evaluation criteria developed by the CWG.

Darin went through each of these alternatives in detail and revealed the project team's recommendations for each of the 5 sub-districts that make up the North Shore Region.

Agenda Item III: Discussions

Questions, comments, and responses that were recorded during the meeting are presented below:

Question: Where do the population density figures come from? Do they use census data?

Response: The DPP numbers do incorporate some census data but also reflects projected growth based on existing planning.

Comment: Nothing has been done for decades despite studies showing contamination in soils and ground water; the watershed needs to be protected.

Response: This project deals with wastewater from human sources, not runoff from storms, etc.

Question: Why not do a centralized treatment facility?

Response from various individuals: economics; City's past track record; not most appropriate or feasible solution for some areas within the region; siting concerns.

Comment: If private plant owners provide their facilities (bathrooms) for use by the public, the plant owners should receive some form of credit or exemption.

Question: Are contaminants in the ocean related to where the beach parks are located?

Response: Could also be from homes near the shoreline; it's hard to know for sure.

Comment: The Army wanted to turn its wetlands project over to Dole but Dole refused.

Response: The wetlands project was only a test system.

Question: Can wastewater be treated to drinking water quality like they do in Sweden?

Response: Technically yes, but the problem is the stigma attached to drinking what once was wastewater.

Comment: I really appreciate the work of the team on this project. We are going to have major growth and if we don't act to deal with the increase in wastewater, we're going to have a big problem. This plan is good forethought.

Question: If building pipelines along the shoreline is difficult or too expensive, what about trucking the wastewater to a facility?

Response: Some of that is being done now. When cesspools need to be pumped, the wastewater is hauled to a treatment facility.

Question: Have costs for these recommendations been looked at?

Response: Yes, but the numbers are only ballpark figures.

Question: There are lots of properties only a few feet above the water table. Septic systems are still going to result in accumulation of contaminants. Does anyone track this?

Response: Not really.

Comment: This plan doesn't really clean up all of the chemicals and there will be continued degrading of the environment.

Response: There are more recent studies on chemicals of concern and the EPA is working on establishing acceptable limits. Septic systems do provide some treatment and nature also works to clean up some of the contaminants. Septic systems are the bare minimum that can be done but homeowners could choose to do more.

Comment: Maybe the report could say if all of this were done, what percent water would receive high quality treatment.

Comment: If more people install septic systems, they will be taking themselves out of the pool of people who could be paying for better approaches. There will be less people to spread the costs around.

Question: Could some of these alternatives be promoted by saying they will create green jobs?

Response: It's possible, but the economic climate is such that funding is tight

Question: What about sending wastewater to Turtle Bay's facility where they have excess capacity?

Response: We have talked with them about this. There would be major costs and inconvenience involved in digging up the road to lay pipe and install pumps. Also, by the time this could be done, Turtle Bay's own needs might have changed.

Response: You don't necessarily need to dig up the roadway. There is room to install pipe outside of the pavement.

Question: What about implementation?

Response from Tim: This is a different kind of exercise in that it's not a "build this" type of plan. This plan presents all kinds of potential solutions and timing will depend on regulatory issues (e.g., if EPA totally bans cesspools) or if a private party wants to come in and do something. Then we would have the recommended approaches in place to be implemented. This won't happen tomorrow but in ten years, things will happen. If we went with the standard way we do things, it might take 40 years to get something done. Some of the things in this plan could actually occur sooner.

Question: Is Kamehameha Schools looking at similar alternatives for wastewater that could combine flows for reuse?

Response: While Kamehameha Schools is open to dialogue, studies to this point have focused only on the added flows that would come from its properties.

Agenda Item IV: Next Steps

Leland thanked everyone for their participation and stated that the next steps after this meeting are to evaluate comments, finalize the plan, and hold one more CWG meeting.

Appendix E: Alternative Funding Sources

Appendix E

Alternative Funding Sources

There are five potential sources of alternative federal funding for projects on the North Shore.

- USDA Rural Utilities Service
- HUD-CDBG
- State Revolving Fund (US EPA), and
- US Bureau of Reclamation
- Rural Community Assistance Partnership (RCAP)

US Department of Agriculture, Rural Utilities Development

Table E-1. Rural Utilities Service Water and Waste Disposal Program

		Comments
Type of Help	<p>Grants and Loans.</p> <p>The Water and Waste Disposal (WWD) program provides both loans and grants to rural communities (with 10,000 people or fewer) for drinking water, wastewater, solid waste, and storm drainage projects. RUS also administers the "Water 2000" initiative to bring safe, affordable drinking water to all rural areas by the year 2000. These programs are administered locally by state and area rural development offices.</p>	
What's Funded?	<p>Almost anything related to getting water, wastewater, and solid waste systems up and running in small municipalities is fundable. For instance, funds may be used to install, repair, improve, or expand rural water or wastewater disposal facilities.</p> <ul style="list-style-type: none"> • Funding covers such things as: <ul style="list-style-type: none"> • construction; • land acquisition; 	<ul style="list-style-type: none"> • legal fees; • engineering fees; • capitalized interest; • equipment; • initial operation and maintenance costs; • project contingencies; and • related costs for completing the project.
Who's Eligible?	<p>Eligible applicants include public bodies and nonprofit organizations such as:</p> <ul style="list-style-type: none"> • municipalities; • counties; • districts, authorities, and other political subdivisions; • associations; • cooperatives; • nonprofit corporations; • Indian tribes on federal/state reservations; • other federally recognized Indian tribes. <p>To qualify:</p> <ul style="list-style-type: none"> • your project must be located in a rural area or town with 10,000 people or fewer; 	<ul style="list-style-type: none"> • your community is unable to get credit elsewhere at reasonable rates and terms; • your project is economically feasible; • you have no outstanding judgment obtained by the United States in Federal Court; and • you have the legal authority to construct, operate, and maintain the facility, and can obtain, give security for, and repay the loan.

Table E-1. Rural Utilities Service Water and Waste Disposal Program		
		Comments
How to Apply	<p>File requests for WWD funds any time of the year at any rural development office in the county, district, or state. Just follow these steps:</p> <ul style="list-style-type: none"> Fill out the simple form, SF-424, or "Application for Federal Assistance (Construction)" to outline the project and the Federal help needed. 	<ul style="list-style-type: none"> Get satisfactory review comments from the appropriate state agency (usually takes about 45 days). Submit supporting documents, as needed. <p>Your local rural development office can tell you which state agency covers your project area and what supporting documents are needed.</p>
Program Contacts	<p>Regional or local office: Contact your state rural development or rural utilities service county or district office.</p> <p>Tel.: 202-720-9583 Fax: 202-690-0649 Web site: http://www.usda.gov/rus/water/</p>	<p>Headquarters office: U.S. Department of Agriculture Rural Utilities Service Assistant Administrator Water and Environmental Programs 1400 Independence Ave., SW Washington, D.C. 20250</p>

US Department of Housing and Urban Development

Table E-2. US EPA State Revolving Fund Loans		
		Comments
Type of Help	<p>Project Grants.</p> <p>The Community Development Block Grant (CDBG) program gives grants directly to states, which then allocate them to small cities and nonurban counties. Grants may be used for community and economic development activities, but are primarily used for housing rehabilitation, public infrastructure projects--e.g., wastewater and drinking water facilities--and economic development. Seventy (70) percent of grant funds must be used for activities that principally benefit low- and moderate-income persons.</p>	
What's Funded?	<p>States decide funding priorities, and tailor the programs to their own needs.</p> <p>Generally, fundable projects:</p> <ul style="list-style-type: none"> benefit low- and moderate-income persons; or help correct or prevent public health and safety problems, slums, or blight. 	<p>There are three types of projects:</p> <ul style="list-style-type: none"> neighborhood revitalization projects that emphasize private housing rehabilitation; economic development projects that can expand employment; and water, sewer, and other public facilities projects that protect public health and reduce environmental risk.
Who's Eligible?	<p>Eligibility varies by state. States administer the state CDBG program. HUD administers the Small Cities program only for New York and Hawaii, which elected not to administer the program. States that administer CDBG funds must distribute funds to such eligible recipients as:</p>	<ul style="list-style-type: none"> villages; small towns; cities with populations of 50,000 or less; nonurban counties; or units of general local government that carry out development activities.

Table E-2. US EPA State Revolving Fund Loans		
		Comments
How to Apply	Contact your state agency. Each state has its own application forms, requirements, and procedures. States must notify localities of opportunities to apply for CDBG funds. Two common methods of notification are:	<ul style="list-style-type: none"> a public notice published in a general circulation newspaper; or a mass mailing to every eligible community in the state.
Program Contacts	<p><u>State or local housing agency:</u></p> <p>HUD has approximately 42 offices nationwide. See your local telephone directory. Local officials should contact their state agencies, then the appropriate HUD field agency.</p> <p>Clearinghouse for more information: 1-800-998-9999, or visit the website below.</p>	

Table E-3. U.S. Environmental Protection Agency		
		Comments
Type of Help	<p>Federal formula grants to states; loans made by states to eligible parties.</p> <p>EPA's Clean Water State Revolving Fund (CWSRF) program provides grants to states (and Puerto Rico) to capitalize state loan funds. States provide a 20-percent match. Each state SRF then makes low-interest loans to communities, individuals, and others for high-priority water-quality management activities. As money is paid back into the revolving fund, new loans are made to help others maintain their water quality.</p> <p>This federal-state partnership gives states the flexibility to fund their highest priority projects to improve water quality.</p>	
What's Funded?	<p>SRF loan funds may be used to improve watershed quality through a wide range of projects. Loans may also be used to protect groundwater resources. While traditionally used to build or improve wastewater treatment plants, loans are increasingly being used for:</p> <ul style="list-style-type: none"> agricultural, rural, and urban runoff control; 	<ul style="list-style-type: none"> estuary improvement practices; wet-weather flow control, including storm water and combined sewer overflows; and alternative treatment technologies. To receive funding, a project must be included in a state's intended use plan, in which the state outlines the projects to be funded.
Who's Eligible?	<p>The SRF program is managed largely by the states; therefore, project eligibility varies according to each state's program, priorities, and practices. Eligible loan recipients may include:</p>	<ul style="list-style-type: none"> local governments; communities; nonprofits; individuals; citizens' groups; and others.
How to Apply	Each state has its own application procedures. Potential projects must meet Clean Water Act and state requirements to be eligible	

US Bureau of Reclamation

The Bureau of Reclamation's water reclamation and reuse program is authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575).

Also known as Title XVI, the act directs the Secretary of the Interior to undertake a program to investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic and agricultural wastewater, and naturally impaired ground and surface waters, and for design and construction of demonstration and permanent facilities to reclaim and reuse wastewater. It also authorized the Secretary to conduct research, including desalting, for the reclamation of wastewater and naturally impaired ground and surface waters.

The original act authorized Reclamation to participate in the construction of 5 recycling projects, 3 of which were located in Southern California—the San Diego Area Water Reclamation Program, Los Angeles Area Water Reclamation and Reuse Project, and San Gabriel Basin Demonstration Project—and 3 feasibility studies, with 1 located in Southern California – the Southern California Comprehensive Water Reclamation and Reuse Study.

In 1996, Congress amended Title XVI and authorized Reclamation to participate in an additional 18 projects, 8 of which are located in Southern California: Long Beach Desalination Research and Development Project, North San Diego County Area Water Recycling Project, Calleguas Municipal Water District Recycling Project, Pasadena Reclaimed Water, Orange County Regional Water Reclamation Project - Phase I, Hi-Desert District Wastewater Collection and Reuse Facility (Yucca Valley), Mission Basin Brackish Groundwater Desalting Demonstration Project, and Long Beach Area Water Reclamation and Reuse Project.

Since then, Congress has amended Title XVI several times to authorize Reclamation to participate in many additional projects, including 5 in Southern California: Irvine Basin Groundwater and Surface Water Improvement Projects, Inland Empire Regional Water Recycling Project, Cucamonga Valley Water Recycling Project, Southern California Desert Region Integrated Water and Economic Sustainability Plan, and Eastern Municipal Water District Recycled Water System Pressurization and Expansion Project.

Prior to providing construction funding, a project needs to have an approved feasibility study. The requirements and review process are included in the Reclamation Manual Directives and Standards—WTR 11-01.

The act, as amended, has authorized a total of 43 specific projects, 17 of which are located in the Southern California Area Office's activity boundaries. When all SCAO Title XVI projects are completed, they are expected to produce about 400,000 acre-feet of recycled water annually.

Rural Community Assistance Partnership

RCAC is a nonprofit organization that provides technical assistance, training and financing so rural communities achieve their goals and visions. Headquartered in West Sacramento, California, RCAC's more than 100 employees serve rural communities from 40 plus field locations in 13 western states, plus the Western Pacific.

RCAC's work encompasses a wide range of services including technical assistance and training for environmental infrastructure; affordable housing development; economic and leadership development; and community development finance. These services are available to a variety of communities and organizations including communities with populations of fewer than 50,000, other nonprofit groups and tribal organizations.

The RCAC web site is <http://http://www.rcac.org>.