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

STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

June 24, 2015
Honolulu, Hawaii

Approval of the Project Description for the
County of Kauai's Water Use and Development Plan Update

SUMMARY OF REQUEST

Staff requests that the Commission approve the project description for the County of Kauai's Water Use and Development Plan update (Exhibit 1).

BACKGROUND

The State Water Code, Chapter 174C, HRS, requires that the Commission on Water Resource Management (Commission) implement and utilize comprehensive water resources planning in its regulation and management of our State's water resources. The Water Code sets forth the requirement for initial development and updating of the Hawaii Water Plan (HWP) to guide the Commission in executing its general powers, duties, and responsibilities assuring economic development, good municipal services, agricultural stability, and environmental protection.

The HWP is intended to serve as a continuing long-range guide for water resource management. The HWP currently consists of five major components (plans) identified as the: 1) Water Resource Protection Plan, 2) Water Quality Plan, 3) State Water Projects Plan, 4) Agricultural Water Use and Development Plan, and 5) County Water Use and Development Plans (WUDP). The Water Code mandates that these individual plans be prepared and integrated into a comprehensive "master plan" to provide for effective coordination and long-range planning between state and county agencies to link water use, development, and protection of the resource.

To fulfill this mandate, the components of the HWP must be reviewed and updated on a regular basis. The initial HWP adopted by the Commission in 1990, provided the means to address many issues, including but not limited to, establishment of ground water hydrologic units, estimates of sustainable ground water yields and surface water flows by island, existing water systems, and an initial evaluation of current and projected water needs for the State and the Counties.

D1

An updated HWP is considered essential to effective coordination and integration of State and County actions related to sustainable water resource development and enables the Commission to more effectively implement the statutory objectives of the Water Code. Absence of updated information can lead to preparation and implementation of inadequate or unrealistic plans for development of existing and alternative water resources, and may result in conflicting objectives or uses that threaten our State's limited water resources. The lack of up-to-date demand projections and proposed strategies to meet such demands limit the State's and Counties' ability to address future water development and resource protection issues.

In updating the HWP components, there is consensus agreement among State and County agencies that a comprehensive water resource planning process is needed to address the problems of supply, demand, and conservation of water. Accordingly, the required updates/revisions to the HWP should follow and utilize an evaluation and assessment process that emphasizes the consideration of various planning scenarios incorporating uncertainties, environmental externalities, and public needs into a strategic decision-making process.

Under a comprehensive resource planning approach, all types of resources would be assessed and weighed in the context of new/existing supply-side resources, alternative source development such as wastewater reuse, conservation, alternative rate structures, as well as other demand-side management methods. In this process, the concept of least-cost planning can be pursued while balancing supply- side and demand-side management issues. A major outcome of this effort will be the development of coordinated strategies to meet future water demands, including greater use of alternative water sources, wherever possible.

STATEWIDE FRAMEWORK

Updating the various components of the HWP should take into consideration current statutory objectives that include, but are not limited to, obtaining maximum reasonable-beneficial uses of water; protection of natural resources, existing water rights (including the Department of Hawaiian Homelands) and traditional and customary Hawaiian practices; protection and procreation of fish and wildlife; and the maintenance of proper ecological balance, scenic beauty, and recreation.

In addition, the updating process should lead to refinement of demand projections, planning principles, and strategies associated with water resource planning and development. Such efforts should result in: identification and assessment of potential new sources; more realistic demand projections/forecasts; improvements in the operation of existing systems; application of various screening criteria/analyses; more effective integration between demand- and supply-side resource options; and overall improved coordination between State and County WUDPs.

Another element of the updating process should include a facilitated public participation process involving the community, public interest groups, and government agencies involved in the preparation of the County WUDPs. Under such a process, it is envisioned that stakeholder and/or community groups may be formed by the county to scope issues and address water-related concerns using a collaborative (as opposed to an adversarial) process.

The planning objectives described above are clearly set forth and established within *The Statewide Framework for Updating the Hawaii Water Plan* (Framework) adopted by the Commission in February 2000. Recommended planning elements for each component of the HWP are prescribed in the adopted Framework, including issues that should be addressed as part a comprehensive updating process.

In addition to the statutory requirements set forth in the Water Code, key elements of the Framework pertaining to the update of the County WUDPs include, but are not limited to:

- Submission of a County-Specific WUDP Project Description for review and approval by the Commission. The Project Description should include:
  - Identification of specific issues relating to land use, water use and resource development, and the relative priority of the issues to be addressed in the WUDP update;
  - An outline of the County's plan for establishment of planning objectives and evaluation criteria;
  - A description of its public/stakeholder participation and public information program;
  - A description of its plans for identification of: water demand forecasts (and the consideration of future uncertainties) within the hydrologic units and water availability limits established by the Commission, conservation and demand-side management programs, source development options and any potential impacts to the resource, and the development and integration of resource development strategies;
  - A schedule for the County's updating of the WUDP, which shall:
    - Outline the different stages and activities of the County's planning effort;
    - Indicate the approximate times and anticipated duration for public participation activities;
    - Indicate the approximate timeframe for County approval of the WUDP and submission of the WUDP to the Commission for adoption;
  - A description on how information from the State Water Projects Plan and the Agricultural Water Use and Development Plan will be integrated and used in updating the WUDP.
- Each County shall brief the Commission and its staff regarding any planned updates of the County WUDP; and
- Lastly, periodic milestone briefings to the Commission by the County shall also be required as part of the WUDP updating process.

Key statutory requirements that should be addressed as part of the WUDP update include:

- Consistency with:
  - The Water Resource Protection Plan and Water Quality Plan;
  - County land use plans and policies; and
  - State land use classification and policies.
- The status of water and related land development including an inventory of existing water uses;
- Future land uses and related water needs;
- Regional plans for water developments including recommended and alternative plans, costs, and adequacy of plans;

- Consultation and careful evaluation of recommendations of concerned Federal, State and County agencies;
- Incorporation of the current and foreseeable development and use needs of the Department of Hawaiian Home Lands (DHHL); and
- Lastly, updating and modification of the WUDP as necessary to maintain consistency with its zoning and land use policies.

The statutory and Framework provisions described above set forth the minimum requirements for updating the WUDP component of the HWP, including the overall-planning framework that should be followed by the Counties in updating their respective WUDPs. The required elements are consistent with the goals and policy of the Water Code and the Commission's mandate to manage and protect the State's water resources. The envisioned outcomes, benefits, and products are directly supportive of the Commission's duties and responsibilities set forth in §174C-5, HRS, and the requirements of the HWP described in §174C-31, HRS.

PROJECT DESCRIPTION FOR THE WUDP UPDATE

In accordance with these established provisions, the County of Kauai, Department of Water Supply, has submitted to the Commission for review and approval, the attached "Kauai Water Use & Development Plan Update Project Description" dated May 2015 (Exhibit 1).

Staff has evaluated the Project Description and the planning elements described therein and have determined that the proposed WUDP updating process meets with the provisions and guidelines set forth in the State Water Code and the Commission's Statewide Framework for Updating the Hawaii Water Plan.

The proposed approach for updating is similar to the County of Hawaii's WUDP 2010 update, which was approved by the Commission in 2011. Under this approach, a uniform, island-wide review of the sustainability of land use plans, policies, and designations will be conducted. This will result in the identification of sensitive areas for which more detailed regional planning may be warranted. For example, following the completion of the County of Hawaii's WUDP update in 2010, Hawaii County has initiated the development of regional WUDPs for the Keauhou and Waimea Aquifer System Areas, which were found to exceed the respective aquifer system areas' sustainable yields under full build-out scenarios based on current General Plan and zoning designations.

This type of analyses fulfills a key objective of the WUDP – to assess the long-term sustainability of county land use plans with regard to water resources. Early assessment of demand projections relative to water resource availability can inform subsequent land use decisions and policies and provide the opportunity to attach appropriate conditions to development approvals that will help to address water issues. It can provide the county time to adjust its land use vision as well as to develop alternative water sources, storage or transmission system improvements, and implement water conservation or other measures to help meet future demands within the sustainable limits set in the Water Resource Protection Plan. The County WUDP is a means to integrate land and water planning and can help to ensure stakeholders and regulatory agencies that the county has a plan to meet existing and future water needs that recognizes, respects, and protects public trust resources and uses.

Staff looks forward to Kauai County's adoption of a "living document" approach, which facilitates regular updating of the WUDP, and the development of an updated WUDP that conforms to the intentions and plans of the counties in terms of land use planning to provide guidance for decision-making on water allocation requests and the formulation of recommended and alternative strategies for resource development to meet future demand scenarios.

Upon completion of the plan update and approval by the Board of Water Supply, CWRM will schedule a public hearing on Kauai to maximize public participation in the updating of the County's WUDP.

RECOMMENDATION

Staff recommends that the Commission:

1. Approve the County of Kauai's Project Description for updating its Water Use and Development Plan; and

2. Authorize staff to participate in meetings and/or workshops, as necessary, with pertinent State and County agencies to facilitate implementation of statutory and framework provisions for updating the County Water Use and Development Plan.

Respectfully submitted,

W. ROY HARDY
Acting Deputy Director

Exhibit 1 May 2015 Kauai Water Use and Development Plan Update Project Description

APPROVED FOR SUBMITTAL:

SUZANNE D. CASE
Chairperson

TECHNICAL MEMORANDUM
Kauai Water Use & Development Plan Update
Project Description

I. INTRODUCTION

In 1987, the State Legislature passed the State Water Code (Hawaii Revised Statutes, Chapter 174C) to protect Hawaii's surface and ground water resources. The waters of the State are held in a public trust, and cannot be owned privately. The Public Trust Doctrine is a policy of the State Water Code and is stated as follows:

> *It is recognized that the waters of the State are held for the benefit of the citizens of the State. It is declared that the people of the State are beneficiaries and have a right to have the waters protected for their use.* (HRS §174C-2(a)).

The State Water Code (the Code) called for the establishment of a Commission on Water Resource Management (CWRM) that would be responsible for administering the Code. Part of the requirements set forth in the Code was the formulation of a *Hawaii Water Plan* that would serve as a dynamic, long-range planning guide for the Commission. The Commission established the Hawaii Administrative Rules Chapter 13-170, *Hawaii Water Plan*, which specifies and clarifies definitions, procedures, requirements, etc., required by, but not specified in, the Code.

The objectives of the *Hawaii Water Plan* are as follows:

- Proper conservation and water development
- Reasonable and beneficial use of water
- Control of water for public purposes
- Attainment of adequate water quality
- Provision for Department of Hawaiian Home Lands needs and Hawaiian water rights
- Implementation of water resource policies
- Linkage between land use and water by County "home rule"

The *Hawaii Water Plan* consists of five parts:

(1) the *Water Resource Protection Plan* (WRPP),
(2) the *Water Quality Plan* (WQP),
(3) the *State Water Projects Plan* (SWPP),
(4) the *Agricultural Water Use and Development Plan* (AWUDP), and
(5) the County Water Use and Development Plans (WUDP). A separate WUDP is to be prepared by each of the four Counties.

The original *Hawaii Water Plan*, which did not include the AWUDP at the time, was completed and adopted by the Commission in July 1990. The Code calls for all parts of the *Hawaii Water Plan* to be updated regularly to reflect the current needs of the State. Each of the Counties is responsible to update their respective WUDP as required. Updates of the

Exhibit 1

various elements were drafted in 1992, but were not officially adopted by the CWRM. The AWUDP was added to the *Hawaii Water Plan* by mandate under Act 101, Session Laws of Hawaii (SLH) 1998, by the State Legislature. **Table 1** summarizes the responsible agency, objectives, elements and current status of each of the *Hawaii Water Plan* components.

Table 1 – *Hawaii Water Plan* Components

***Hawaii Water Plan* Document**	**Objectives**	**Elements**	**Status**
Water Resource Protection Plan (Commission on Water Resource Management)	To protect and sustain statewide ground/surface water resources, watersheds and natural stream environments.	• Designation of hydrologic units • Characterization & inventory of groundwater and surface water resources • Instream uses • Programs to conserve, augment and protect such resources	1st Update Completed in 2008 2nd Update in Progress
Water Quality Plan (Department of Health)	To protect the public health and sensitive ecological systems by preserving, protecting, restoring and enhancing the quality of ground and surface water throughout the State of Hawaii.	• Water quality criteria and standards • Groundwater protection • Water quality problems • Existing water quality management programs and recommended policies and strategies	1st Update in Progress
State Water Projects Plan (Department of Land and Natural Resources)	To provide a framework for planning and implementation of water development programs to meet projected water demands for state projects.	• Inventory existing State wells, stream diversions and water systems • Identification of proposed State projects/developments • Assessment of future water demand projections • Water development strategy, strategy implementation and recommendations • Incorporation of State agricultural water needs as outlined in the Agricultural Water Use and Development Plan	1st Update Completed in 2003 2nd Update in Progress – limited to Department of Hawaiian Home Lands 3rd State-wide Update in Progress

Table 1 – *Hawaii Water Plan* Components (continued)

***Hawaii Water Plan* Document**		**Objectives**	**Elements**	**Status**
Agricultural Water Use and Development Plan (Department of Agriculture)		To assess State and private agricultural water use, supply and irrigation water systems through a long-range management plan.	• Master inventory of existing irrigation systems • Existing statewide agricultural land uses, assessment of current and future water irrigation needs • Rehabilitation costs, prioritization and program for system repairs • Identification of options for additional/alternative irrigation water sources, conservation, and demand management	Completed in 2003 Revised in 2004 2nd Update in Progress
Water Use and Development Plan (Respective Counties)	Maui	To ensure that the future water needs of the County are met and to provide guidance to the CWRM for decision-making on water uses and water reservation requests.	• Set forth the allocation of water to land use consistent with zoning and land use policies • Current and future water demand forecasts • Water system inventory and profiles • Resource and facility options, including supply sources, transmission, storage and conservation	1st Update in Progress
	Kauai			1st Update in Progress
	Hawaii			1st Update Completed in 2011 2nd Partial Update in Progress
	Oahu			1st Update in Progress

II. HISTORY – KAUAI WUDP

In compliance with the State Water Code, the County of Kauai Department of Water (DOW) was tasked with the responsibility to prepare the *County of Kauai Water Use and Development Plan* in 1988. The original Kauai WUDP was adopted by the County Council by Ordinance No. 568 and endorsed by the Mayor on April 27, 1990. The WUDP was conditionally accepted by the State Commission on Water Resource Management for incorporation into the *Hawaii Water Plan* on June 27, 1990, with the provisions that the WUDP be reviewed and revised as necessary by the County to coincide with the review process of the *Hawaii Water Plan.* The first update was drafted in 1992, but was not officially adopted by the CWRM.

III. KEY REFERENCES & POLICY DOCUMENTS

Key reference and policy documents to serve as the basis of the Kauai WUDP Update include:

1. Hawaii Revised Statutes, Chapter 174C, State Water Code.
2. Hawaii Administrative Rules, Title 13, Department of Land & Natural Resources, Sub-title 7, Water Resources, Chapter 170, Hawaii Water Plan.
3. Statewide Framework for Updating the Hawaii Water Plan, Commission on Water Resource Management, Department of Land & Natural Resources, State of Hawaii, dated February 2000.
4. Kauai Water Use and Development Plan – Review Draft, prepared for the Department of Water, County of Kauai, by R.M. Towill Corporation, dated January 1992.
5. Water Plan 2020, prepared for the Department of Water, County of Kauai, by RW Beck, et al., dated March 2001.
6. Water Resource Protection Plan, prepared for the Commission on Water Resource Management, Department of Land & Natural Resource, State of Hawaii, by Wilson Okamoto Corporation, dated June 2008.
7. Draft Water Quality Plan 2014, Department of Health, State of Hawaii, dated August 2014.
8. State Water Projects Plan, prepared for the Commission on Water Resource Management, Department of Land & Natural Resources, State of Hawaii, prepared by Fukunaga & Associates, Inc., dated February 2003.
9. Agricultural Water Use and Development Plan, prepared for the State Department of Agriculture, prepared by Water Resource Associates, dated December 2003, revised December 2004.
10. NREM-CTAHR-UHM Report on Agricultural Water Use and Irrigation Systems in Hawaii, prepared by Department of Natural Resources and Environmental Management, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, dated July 2010.

11. County of Kauai Important Agricultural Lands Study Final Study, prepared by the University of Hawaii Department of Urban and Regional Planning and the University of Hawaii Economic Research Organization, dated July 2014.
12. 2013 Update of the Hawaii Water Reuse Survey and Report, prepared for the Commission on Water Resource Management, Department of Land & Natural Resources, State of Hawaii, prepared by The Limtiaco Consulting Group, dated July 2013.
13. State Land Use Classification, State Land Use Commission.
14. Kauai General Plan, Planning Department, County of Kauai, dated November 2000.
15. Kauai General Plan Update: Socioeconomic analysis and Forecasts, prepared by SMS Research & Marketing Services, Inc., dated February 2014.
16. Lihue Town Core Urban Design Plan, Planning Department, County of Kauai, June 2009.
17. Kilauea Town Plan, County of Kauai, September 2006.
18. South Kauai Community Plan, Koloa, Poipu, Kalaheo, Omao, Lawai, November 2014.
19. Lihue Community Plan, Planning Commission Approved Draft Final, County of Kauai, Planning Department, November 2014.
20. County Zoning, Planning Department, County of Kauai.
21. Kauai Island Plan, prepared for the State Department of Hawaiian Home Lands, prepared by Group 70 International, dated May 2004.
22. Water System Standards, Department of Water, County of Kauai, 2002.

IV. OBJECTIVE

The primary objective of the WUDP is to set forth the allocation of water to land use. As required by the *Hawaii Water Plan*, each of the four counties is responsible to prepare a WUDP to include, but not be limited to the following:

> *(1) Status of county water and related land development including an inventory of existing water uses for domestic, municipal, and industrial users, agriculture, aquaculture, hydropower development, drainage, reuse, reclamation, recharge, and resulting problems and constraints;*
> *(2) Future land uses and related water needs; and*
> *(3) Regional plans for water developments including recommended and alternative plans, costs, adequacy of plans, and relationship to the water resource protection plan and water quality plan.*

The intent of the Kauai WUDP is to guide the County in its planning, management and development of land use and water resource strategies and policies for sustainable development. The focus of this initial Kauai WUDP update is to conduct an island-wide assessment of water resource supply and demand conditions, with the intent to identify and prioritize sensitive areas of concern. Identification of sensitive areas through this initial update is proposed to guide future subsequent efforts and focus future expenditure of County

resources on these areas in a prioritized manner. Other areas would continue to be monitored for significant changes in water resource information and land use policies.

V. PROPOSED TECHNICAL APPROACH

The County of Kauai proposes to implement the following technical approach. The Kauai WUDP Update will include an inventory of existing water uses, an assessment of available water resources, future water demand projections, and master plan level resource and facility recommendations.

A. General

The *Statewide Framework for Updating the Hawaii Water Plan* (Framework) dated February 2000 was created by the Commission on Water Resource Management to facilitate coordination, integration, and consistency of the components of the *Hawaii Water Plan*. In addition, the Framework is a guide for preparation of the WUDP to ensure effective implementation by the County and utilization by the CWRM for resource management purposes, and provides recommended WUDP update process elements that are incorporated in the proposed technical approach.

The Framework requires presentation of data and analyses based on ground water hydrologic units or aquifer sectors and systems, and surface water hydrologic units, designated by the CWRM.

1. Ground Water

There are 3 aquifer sectors and 13 aquifer systems on the island of Kauai, as shown on **Figure 1**. **Table 2** lists the aquifer sectors and systems, geographical area of coverage, and sustainable yield (MGD, million gallons per day). The State Water Code defines sustainable yield as "the maximum rate at which water may be withdrawn from a water source without impairing the utility or quality of the water source as determined by the commission."

Table 2 – Aquifer Sectors and Systems

Sector Code	System Code	Sector	System	Area (Acres)	SY (MGD)
201		**Lihue**		**145,276**	**131**
	20101		Koloa		30
	20102		Hanamaulu		36
	20103		Wailua		43
	20104		Anahola		17
	20105		Kilauea		5
202		**Hanalei**		**79,765**	**86**
	20201		Kalihiwai		11
	20202		Hanalei		34
	20203		Wainiha		24
	20204		Napali		17
203		**Waimea**		**129,980**	**95**
	20301		Kekaha		10
	20302		Waimea		37
	20303		Makaweli		26
	20304		Hanapepe		22
Total for Island of Kauai				**355,021**	**312**

Source: *2008 Water Resource Protection Plan*
State of Hawaii, DBEDT, Office of Planning GIS Data

2. Surface Water

There are 74 surface water hydrologic units on the island of Kauai, as shown on **Figure 2**. Evaluation of the surface water hydrologic units and the ground water hydrologic units on the island of Kauai indicate that they generally share similar boundaries, thereby allowing the surface water hydrologic units to be "assigned" to a specific ground water hydrologic unit. This is displayed on **Figure 3**, which is an overlay of the surface water hydrologic units and ground water hydrologic units. The only major anomaly in this method is that the surface water hydrologic unit number 2060 (highlighted in red on **Figure 3**) lies over both the Waimea and Makaweli Aquifer Systems (20302 and 20303, respectively). Since the surface water hydrologic units and ground water hydrologic units are well-correlated, surface water data and analyses will be presented based on the ground water hydrologic units or aquifer systems. This will be addressed further in Section C.2 Surface Water below.

For the purposes of the WUDP, all references to water demand and unit rate are proposed to be specific to average day demand, which is pertinent to the evaluation of water resources. Maximum and peak demands are typically used for the planning and

design of water system facilities, including pipeline sizing, reservoir capacity and pump capacity, and are not referred to within this document, unless specifically indicated.

B. Inventory of Existing Water Uses

The CWRM classifies water use based on six categories as listed in the following table taken from the WRPP. Water use will be categorized in accordance with the list to the extent possible.

Well Operator	Category	Sub-Category
Individual Operator	**Agriculture**	• Aquatic plants and animals • Crop irrigation and processing • Livestock water, pasture irrigation, and processing • Ornamental and nursery plants • Taro • Other agricultural applications
	Domestic Residential Domestic, includes potable and non-potable water needs	• Single- and multi-family households, including non-commercial gardening
	Non-residential Domestic, includes potable (and non-potable) water needs	• Commercial businesses • Office buildings • Hospitals • Churches • Hotels • Schools
	Industrial	• Fire protection • Mining, dust control • Geothermal, thermoelectric cooling, power development, hydroelectric power • Other industrial applications
	Irrigation	• Golf course • Hotel • Landscape and water features • Parks • Schools • Habitat maintenance
Agency Operator	**Military**	• All military use
	Municipal	• State • County • Private

1. Water Demand

   a. *Estimated Use of Water, United States Geological Survey (USGS)*

   General information is available from the USGS website, which lists ground water and surface water uses in the County of Kauai for various categories of use. **Table 3** lists fresh water consumption for each use in million gallons per day (MGD) based on data from the year 2010. As indicated in the footnote, "Public Supply" includes various water uses; a breakdown in accordance with the CWRM categories and based on available information is intended to be provided in the WUDP.

Table 3 – Existing Fresh Water Uses

Use	MGD	% of Total
Ground water	**17.56**	**28.94**
Public supply*	13.22	21.78
Industrial	0.00	0.00
Hydroelectric	0.00	0.00
Thermoelectric**	4.04	6.66
Irrigation	0.00	0.00
Livestock	0.18	0.30
Aquaculture	0.00	0.00
Mining	0.12	0.20
Surface water	**43.13**	**71.07**
Public supply*	2.02	3.33
Industrial	0.00	0.00
Hydroelectric	-	0.00
Thermoelectric**	0.00	0.00
Irrigation	41.11	67.74
Aquaculture	0.00	0.00
Mining	0.00	0.00
Total	**60.69**	**100.00**

Source: The USGS *Estimated Use of Water in the United States County-Level Data for 2010* webpage (http://water.usgs.gov/watuse/data/2010/) and USGS *Water Use Data for Hawaii* webpage (http://waterdata.usgs.gov/hi/nwis/water_use/)

* Includes water withdrawn by public and private water suppliers that furnish water to at least 25 people or have a minimum of 15 connections. Public suppliers provide water for a variety of uses, such as domestic, commercial, industrial, thermoelectric-power, and public water use. Public water use includes such purposes as firefighting, street washing, flushing of water lines, and maintaining municipal parks and swimming pools.

**Saline water withdrawn from groundwater sources; where saline water is defined as water that contains 1,000 mg/L or more of dissolved solids. Freshwater is defined as water that contains less than 1,000 mg/L of dissolved solids.

b. Public Water System Data

The State Department of Health regulates public water systems. A public water system is defined as a water system that "has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least sixty days out of the year." **Table 4** lists the Kauai public water systems, owners, number of service connections, and population served. The information was obtained from the State Department of Health sanitary surveys. Customer meter data from the DOW and customer meter data made available by the private water system purveyors will be used to evaluate and categorize the island water consumption. The DOW serves over 60,000 people, and historical average day use based on DOW meter data from 2001 through 2009 ranged from 11.7 MGD to 13.4 MGD.

Table 4 – Kauai Public Water Systems (PWS)

PWS No.	Name	Owner	No. of Connections	Population Served
400	Lihue-Kapaa	DOW	10,697	30,000
401	Anahola	DOW	620	2,174
402	Anini	DOW	61	109
403	Hanalei	DOW	424	1,023
404	Hanapepe-Elelele	DOW	1,710	4,430
406	Kekaha-Waimea	DOW	1,880	5,135
407	Kilauea	DOW	1,468	3,758
408	Koloa-Poipu	DOW	1,408	5,312
415	Haena-Wainiha	DOW	408	1,120
417	Gay & Robinson	Gay & Robinson	325	999
421	Koloa	Grove Farm	19	40
422	Kahili Mountain Park	Kahili Adventist School	38	150
423	Kealia	Kealia Water Co. Holdings, LLC	69	260
425	Kokee State Park	DLNR	93	2,000
426	Polihae State Park	DLNR	1	300
428	Princeville	Princeville Utilities, Co., Inc.	1,029	1,698
430	Pacific Missile Range	U.S. Dept. of Navy	185	1,200
432	Anahola Farm Lots	DHHL	77	385
434	Kalaheo-Koloa	DOW	4,799	15,108

DLNR – State Department of Land and Natural Resources
DHHL – State Department of Hawaiian Home Lands
Source: State Department of Health Sanitary Surveys performed between 2008 and 2011

2. Instream Use

Instream use is defined by the Code as, "beneficial uses of stream water for significant purposes which are located in the stream and which are achieved by leaving the water in the stream. Instream uses include, but are not limited to:

(1) Maintenance of fish and wildlife habitats;
(2) Outdoor recreational activities;
(3) Maintenance of ecosystems such as estuaries, wetlands, and stream vegetation;
(4) Aesthetic values such as waterfalls and scenic waterways;
(5) Navigation;
(6) Instream hydropower generation;
(7) Maintenance of water quality;
(8) The conveyance of irrigation and domestic water supplies to downstream points of diversion; and
(9) The protection of traditional and customary Hawaiian rights."

In accordance with the Code, the CWRM must establish and administer instream flow standards on a stream-by-stream basis as necessary to protect public interests. Instream flow standard is defined as, "a quantity or flow of water or depth of water which is required to be present at a specific location in a stream system at certain specified times of the year to protect fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses." Considerably more research and study needs to be completed to accumulate the data and perspective necessary to conduct a thorough and meaningful assessment of instream flow standards. Until permanent instream flow standards are established, interim instream flow standards have been adopted. According to Section 13-169-46, Hawaii Administrative Rules, "Interim Instream Flow Standard for all streams on Hawaii, as adopted by the commission on water resource management on June 15, 1988, shall be that amount of water flowing in each stream on the effective date of this standard, and as that flow may naturally vary throughout the year and from year to year without further amounts of water being diverted offstream through new or expanded diversions, and under the stream conditions existing on the effective date of the standard, except as may be modified [by the commission]." Instream use will be based on the best available information available from CWRM.

The Code states that "adequate provisions shall be made for the protection of traditional and customary Hawaiian rights, the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of waters of the State for municipal uses, public recreation, public water supply, agriculture, and navigation." The Code also specifically discusses the protection of Native Hawaiian water rights.

a. Native Hawaiian Water Rights

Section 174C-101 of the Code discusses the protection of Native Hawaiian water rights in greater detail addressing reservation of water for Hawaiian Home Land allotments, and traditional and customary rights, including appurtenant rights. Hawaiian Home Lands are discussed further in section V.D.2.c.ii of this document. In describing traditional and customary rights, Section 174C-101 states that "traditional and customary rights of ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778 shall not be abridged or denied by this chapter [the Code]. Such traditional and customary rights shall include, but not be limited to, the cultivation or propagation of taro on one's own kuleana and the gathering of hihiwai, opae, o'opu, limu, thatch, ti leaf, aho card, and medicinal plants for subsistence, cultural, and religious purposes."

Water resource strategies will be reviewed for potential impacts to instream uses and Native Hawaiian water rights. Water supply reliability and quality, feasibility, environmental and cultural impacts, and water rights will be considered as projects and programs develop. More detailed and site specific evaluation of these impacts will be required and accomplished through the environmental review process (HRS Chapter 343).

C. Assess Available Water Resources

Naturally occurring water resources on the island of Kauai include ground water, surface water or stream diversions, and rainwater catchment. Conservation is vital to preservation of these valuable water resources. Water supply can be further augmented by wastewater reclamation and desalination. Water quality varies with the source, and depending on the proposed use, treatment requirements also vary. Water quality protection is covered by the *Water Quality Plan*, which describes the Department of Health and other programs which protect existing and potential sources of drinking water.

The inventory of the existing ground water sources and stream diversions is intended to be obtained from the CWRM database. Reclaimed wastewater information is intended to be obtained from the Department of Health, Wastewater Branch and is also available in the recent Update of the Hawaii Water Reuse Survey and Report, July 2013.

1. Ground Water

The CWRM database on wells was developed with information received from the Well Registration program and, since 1998, supplemented with information obtained through the well construction/pump installation permitting process. The

CWRM also has data on well pumpage, which only includes wells that are reported; therefore the data on well pumpage is not complete in all areas. These databases are the best available information and are proposed to be used to evaluate the existing ground water resources.

Based on the CWRM well database and limited available updated well information, the island of Kauai has 298 well sources with a total pumping capacity of 227.7 MGD, as listed in **Table 5** and shown on **Figure 4**.

Table 5 – Ground Water Resources

Category	# of Wells	Capacity (MGD)	% of Total Capacity
Agriculture	29	96.1	42
Domestic	91	4.3	2
Industrial	10	41.2	18
Irrigation	34	21.9	10
Municipal	73	59.6	26
Observation	25	2.3	1
Others	36	2.3	1
Total	298	227.7	100

Source: CWRM Well Database

Table 6 summarizes the sustainable yield (SY), preliminary assessment of current production and percentage of SY for the current production. Current production is represented by the highest 12-month moving average (MAV) or the highest annual average yield calculated from the actual pumpage data for each aquifer system/sector from January 2007 to September 2009.

Table 6 – Sustainable Yield

Aq Code	Sys Code	Sector	System	SY (MGD)	High 12-Month MAV (MGD)	High 12-Month MAV SY (%)
201		**Lihue**		**131**	**9.61**	**7.34**
	20101		Koloa	30	3.99	13.29
	20102		Hanamaulu	36	2.39	6.63
	20103		Wailua	43	0.43	1.00
	20104		Anahola	17	1.99	11.69
	20105		Kilauea	5	0.82	16.32
202		**Hanalei**		**86**	**1.85**	**2.15**
	20201		Kalihiwai	11	1.31	11.95
	20202		Hanalei	34	0.23	0.67
	20203		Wainiha	24	0.31	1.28
	20204		Napali	17	0.00	0.00
203		**Waimea**		**95**	**2.32**	**2.44**
	20301		Kekaha	10	1.48	14.79
	20302		Waimea	37	0.00	0.00
	20303		Makaweli	26	0.26	1.00
	20304		Hanapepe	22	0.58	2.62
		Island of Kauai	**Total**	**312**	**13.77**	**4.41**

Source: CWRM Well Database

CWRM well database and sustainable yield information indicate that current pumpage is well within the sustainable yield of each aquifer system with the highest percentage in the Kilauea Aquifer System at 16.32% of the 5 MGD SY, which translates to 0.82 MGD.

2. Surface Water

The annual rainfall on the island of Kauai generally tends to be greater than the rest of the major Hawaiian Islands, with Mount Waialeale reputed to be one of the world's wettest spot with annual rainfall of 450 inches per year. The island's wet climate has provided substantial surface water sources, which supported major agricultural production (primarily sugarcane) in the past.

The CWRM has 292 declared stream diversions on the island of Kauai. **Figure 5** shows the locations and distribution. The stream diversions are associated with surface water hydrologic units, and as mentioned earlier, the surface water hydrologic units will be correlated with the ground water hydrologic units.

Accordingly, surface water data and analyses will be presented based on the ground water hydrologic units or aquifer systems.

Currently, there are no quantitative interim instream flow standards for any streams located on Kauai; meaning that unlike ground water aquifer systems with an associated sustainable yield, there is no designated quantity of water that may be diverted without degrading a stream. In order to assess surface water sustainability, it is assumed that no additional diversions will be allowed from any stream. Each existing declared diversion reported in the CWRM surface water diversion database will be assigned to an aquifer system to estimate the amount of surface water that may be used in each aquifer system. The potential capability of irrigation systems to transfer surface water to adjacent aquifer systems will be noted (irrigation system database indicates presence of flume or pipe), particularly if adjacent areas are deficient in surface water sources to meet the projected surface water demands.

Table 7 lists the major stream diversions or ditch systems and assessed conditions.

Table 7 – Major Irrigation Systems

Major Irrigation System	Status	Condition
Anahola Ditch	Inactive	Poor
East Kauai IS	Unknown	Fair
Kaloko and Puu Ka Ele Ditches	Unknown	Dam failed
Kauai Coffee IS	Partially Active	Unknown
Kekaha Ditch IS	Active*	Fair
Kokee Ditch IS	Active*	Fair
Olokele Ditch	Active	Unknown
Upper and Lower Haiku Ditches	Partially Active	Unknown, portions non-operational
Upper and Lower Lihue Ditches	Active	Fair
Waiahi-Kuia Aqueduct	Partially Active	Unknown

Source: *Agricultural Water Use and Development Plan, 2003 rev. 2004*
NREM-CTAHR-UHM Report on Agricultural Water Use and Irrigation Systems in Hawaii, 2010
** Kekaha Agriculture Association Overview of Ditch System and Agricultural Infrastructure Presentation to CWRM, April 29, 2015*

3. Water Conservation

The Hawaii Water Conservation Plan defines water conservation as the reduction in fresh water use by improving the efficiency of water delivery and end water uses. Minimizing losses and waste in water delivery systems and increasing the efficiency of end water uses, increase the amount of water available and help to ensure the long-term viability of water resources.

The DOW's current conservation activities include 100% customer metering, meter repair/replacement program, non-metered water analysis/report, leak detection, tank overflow controls/alarms, plumbing code water efficient fixture and pressure reducing valve requirement, voluntary water restriction notice, and public outreach/education programs. Public participation and cooperation is key to the success of water conservation programs. In addition to its public outreach/education programs, the DOW provides the public with water conservation tips and resources on its website.

As required by the Framework, conservation by agricultural water use is covered by the AWUDP. For the irrigation systems under the jurisdiction of the State Department of Agriculture (DOA), DOA evaluates and prioritizes system rehabilitation. Conservation by farmers is encouraged through metering; efficient use of water by farmers is inherent to maintain their economic viability.

Another part of water conservation is resource conservation. The objective of resource conservation is "to assure optimum development of sources to protect them against contamination, waste, and overdraft." Resource conservation includes the protection of watersheds. Watersheds are precipitation infiltration areas, where rainfall percolates through the soil, that are crucial to the replenishment and preservation of basal aquifers.

4. Rainwater Catchment

Rainwater catchment systems are typically located outside of the County water system service areas. There are no rainwater catchment public water systems regulated by the Department of Health, Safe Drinking Water Branch. There is no government agency that oversees private individual systems. The owner is responsible for the water quantity, quality and maintenance of the system. Water use by individual catchment systems is determined by deduction, i.e. if a developed parcel is not served by DOW or other water system of record, then it is assumed that it is served by a catchment system. If the County or other private water systems decide to extend water service to these areas, then more water sources will be needed.

5. Reclaimed Wastewater

Reclaimed wastewater is a valuable resource, especially for landscape and agricultural irrigation purposes. **Table 8** lists existing reclaimed water applications, classifications, and capacities for the island of Kauai.

Table 8 – Reclaimed Wastewater Resources

Wastewater Treatment Plant	Reclaimed Water Classification	WWTP Capacity (MGD)	Current Reuse Amount (MGD)	Irrigation Application
Eleele WWRF	R-2	0.8	0	
Grand Hyatt WWRF	R-2	0.25	0.1	Poipu Bay Resort Golf Course - golf course irrigation
Lihue WWRF	R-1	2.5	1.2	Kauai Lagoons Resort - golf course irrigation, Roadway landscaping - landscape irrigation
Lihue-Puhi WWTP	R-1	1	0.4	Puakea Golf Course - golf course irrigation
Poipu WRF	R-1	1	0.36	Kiahuna Golf Club - golf course irrigation, Koloa Landing – landscape irrigation
Princeville WWRF	R-2	1	0.6	Princeville Makai Golf Course - golf course irrigation
Wailua WWRF	R-2	1.5	0.5	Wailua Golf Course - golf course irrigation, Lydgate Park – athletic field irrigation
Waimea WWRF	R-1	0.7	0.3	Kikialoa Land Company - agriculture irrigation

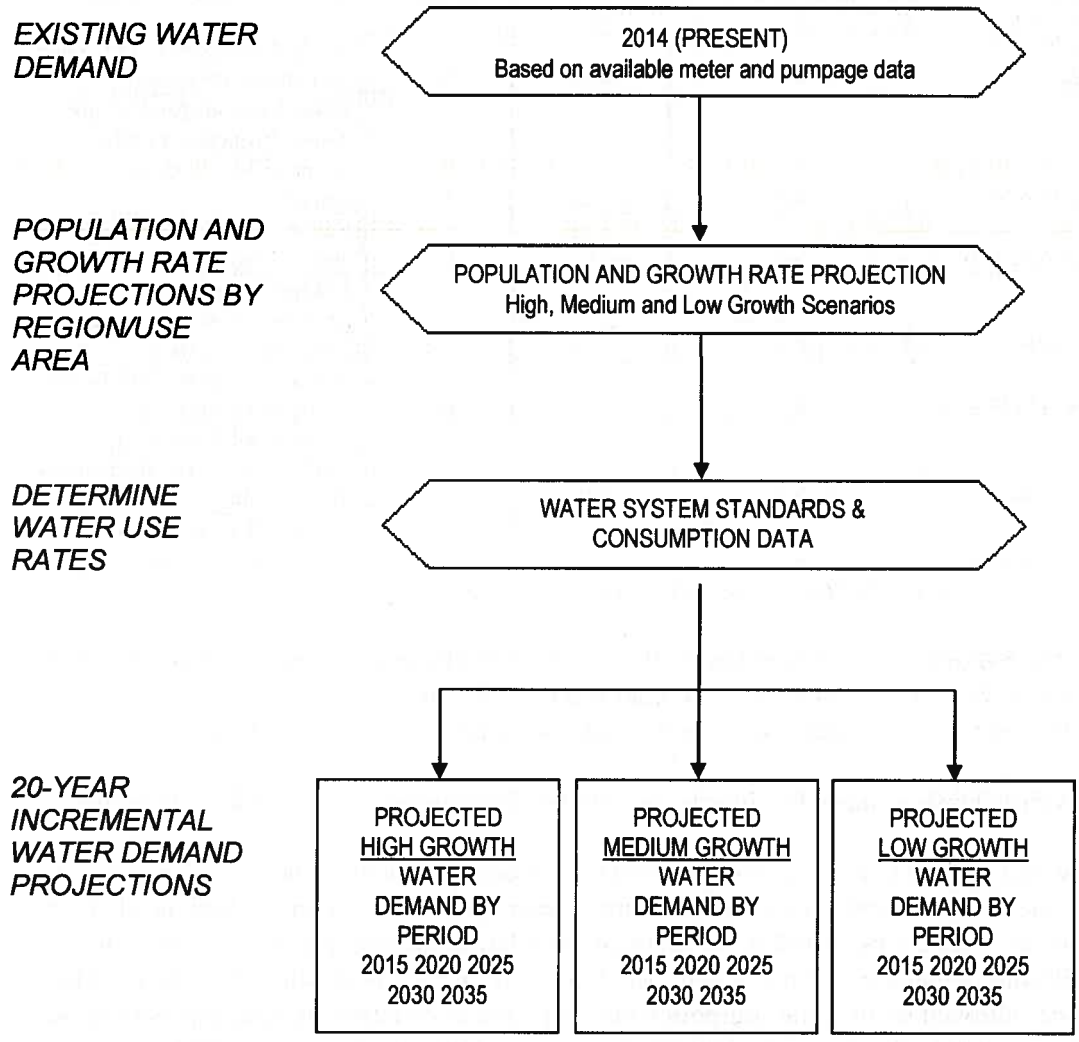
Source: *2013 Update of the Hawaii Water Reuse Survey and Report*

Expanded use of reclaimed water will always be considered as a water resource strategy where applicable. This serves to enhance the sustainable use of water resources by preserving other sources and reusing water that might otherwise be disposed.

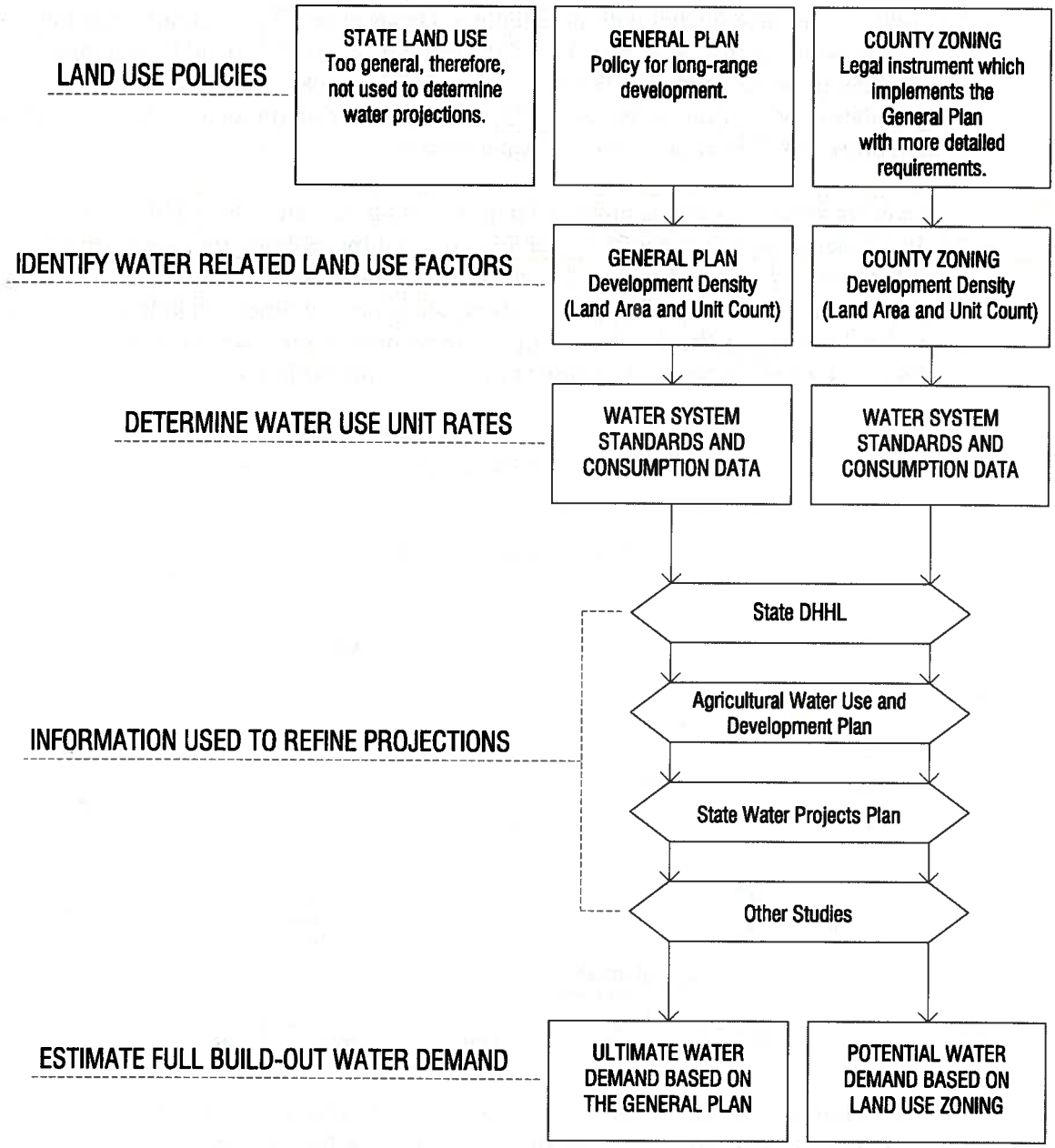
D. Develop Methodology for Integrated Water Resources and Land Use Planning

The planning methodology for the WUDP will consider population growth rate and land use based water demand to plan for future water needs. Incremental water needs for the next 20 years are proposed to be based on population growth rate projections. Full build-out demand or the maximum water needs if all land is developed to the highest extent allowed by the land use policy are proposed to be based on land use evaluations. The intent is to determine the sustainability of water needs associated with the potential full build-out development that is allowed by current land use policies set by the State of Hawaii and the County of Kauai. This proposed island-wide assessment will provide a consistent basis for relative evaluation of the aquifer system areas to identify and prioritize sensitive areas, so that future subsequent water resource planning efforts can be more detailed and focused. Flowcharts illustrating the proposed planning methodology are shown on the following pages.

PROPOSED WATER RESOURCES PLANNING METHODOLOGY
20-YEAR INCREMENTAL WATER DEMAND PROJECTION



PROPOSED WATER RESOURCES PLANNING METHODOLOGY
FULL BUILD-OUT WATER DEMAND

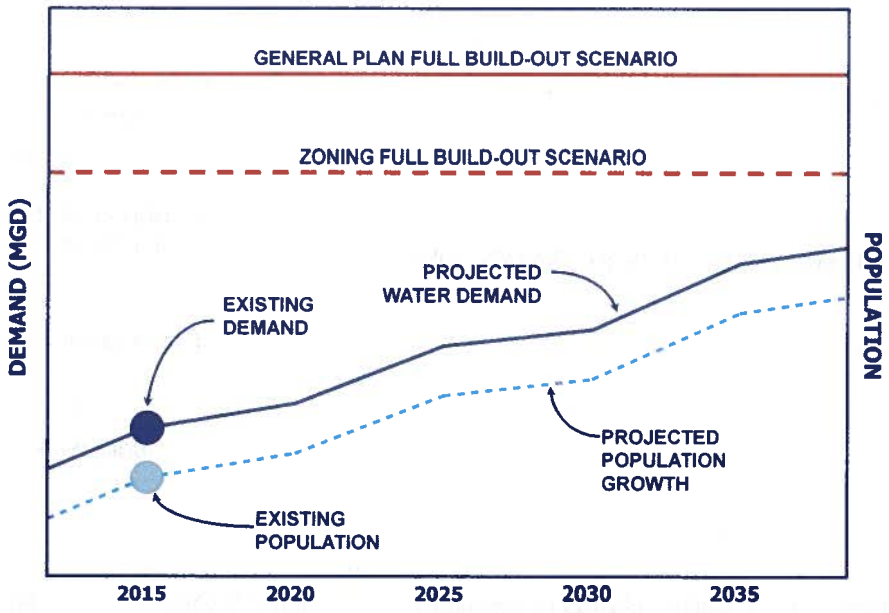


1. 20-Year Incremental Water Demand Projections

Population and growth rate projections are proposed to be used to project water demands in 5-year increments for the next 20 years. The population projections used will be coordinated with the Planning Department. The Planning Department is conducting technical studies in preparation for the next General Plan update. One of these technical studies is the Socio-Economic Forecast, which includes population projections to the year 2035. The population projections from this study are proposed to be used to project water demand.

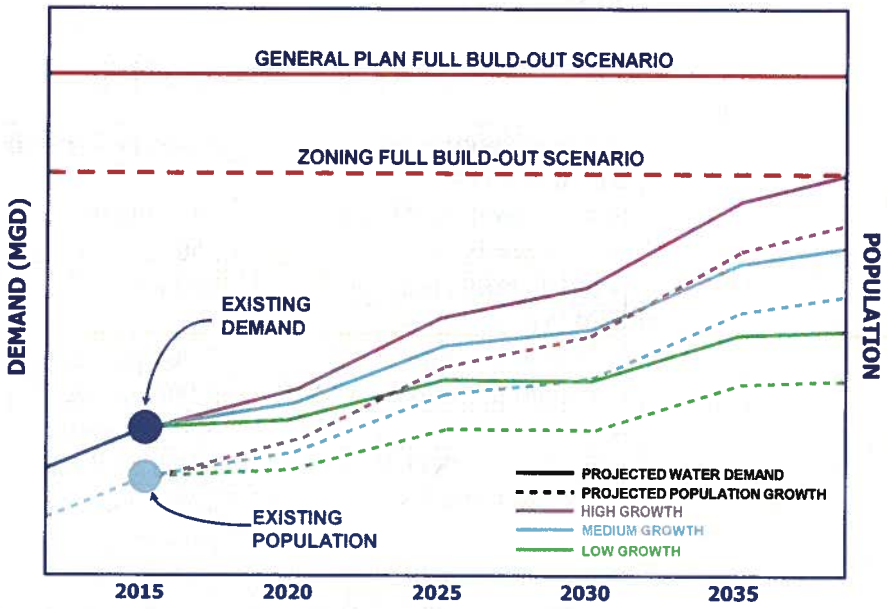
Existing water demand is proposed to be the basis of water demand projections. Water demand to the year 2035 will be projected by applying the population growth rate to existing water demand. Projecting water demand at the same rate as population growth assumes that the character of communities, including per capita water demand and the density of units within communities, will be similar in the future. **Graph 1** shows a theoretical example of the projected demands.

Graph 1 – Projected Demand



The following growth scenarios are proposed to be evaluated for each 5-year increment: high or rapid growth, medium growth or the base case, and low growth which is the most conservative. **Graph 2** depicts a theoretical example with high, medium, and low growth scenarios, which were not shown on **Graph 1** for clarity.

Graph 2 – Projected Demand H-M-L Growth Scenarios



2. Full Build-Out Water Demand

Full build-out water demand is land use based and is the maximum water needs anticipated if all land is developed to the highest extent allowed by current land use policies set by the State of Hawaii and the County of Kauai. The full build-out scenarios are unlikely to occur because it assumes that all land area is developed to the maximum density allowed, including redevelopment of existing developed areas. However, this evaluation will identify areas where water resources are more than adequate to support maximum demands, thereby providing guidance for future assessments to focus efforts on the more sensitive areas. Maximum development, in terms of unit count and land area, is proposed to be determined from land use policies as described below. Full build-out demand is proposed to be determined by multiplying these unit count and land areas by the water use rates that are also described below.

a. Water Use Unit Rates

Water use unit rates are intended to be based on the *Water System Standards* and actual consumption data. Potable and non-potable water requirements will be differentiated as appropriate.

i. Applicable water use unit rates from the *Water System Standards* Table 100-18 – Domestic Consumption Guidelines are listed in **Table 9**.

Table 9 – Domestic Consumption Guidelines

Zoning Designation	Average Daily Demand
RESIDENTIAL:	
Single Family or Duplex	500 gals/unit
Multi-Family Low Rise	350 gals/unit
Multi-Family High Rise	350 gals/unit
COMMERCIAL:	
Commercial Only	3,000 gals/acre
Commercial/Industrial Mix	5,000 gals/acre
RESORT:	350 gals/unit
LIGHT INDUSTRY:	4,000 gals/acre
SCHOOLS, PARKS:	4,000 gals/acre or 60 gals/student
AGRICULTURE:	3,400 gals/acre*

*Agriculture average daily demand based on AWUDP water application rate for diversified crops.

ii. Water use unit rates and per capita rates are proposed to be projected from available historical consumption and population data. This data would be used as a comparison to the *Water System Standards* water use unit rates. The *Water System Standards* water use unit rates will be used for calculating full build-out water demands unless the historical consumption and population data indicate a rate that is more appropriate.

b. Full Build-Out Land Use Based Water Demand

The State Land Use, County General Plan, County Development Plans, and County Zoning Land Use classifications will be assessed to estimate the projected development densities for each designation at full build-out. The results are proposed to be used to determine a range of water needs at full build-out, and to determine the sustainability of water needs if the development allowed by current land use policies is realized. The State Department of Hawaiian Home Lands property is not subject to the state and county land use classifications and will be specifically addressed as discussed further below.

i. State Land Use

The State Land Use classification is very general with only four land use districts: Urban, Rural, Agriculture, and Conservation. The County administers the local land use policy within the Urban, Rural, and Agricultural districts, while the Board of Land and Natural Resources regulates activities within the Conservation district. The County of Kauai State Land Use acreage by classification is listed in **Table 10** and shown in **Figure 6**.

Table 10 – State Land Use Classification (SLUC)

State Land Use	Acreage	% of Total
Agricultural	144,347	41
Conservation	194,429	55
Rural	1,374	<1
Urban	14,865	4
Total	355,015	100

State of Hawaii, DBEDT, Office of Planning GIS Data
Data as of May 2000

The State Land Use classification has no guidelines to identify the level of development densities within the various districts, and therefore, it has been decided that SLUC will not be used to estimate full build-out water demand.

ii. Kauai County General Plan

The County General Plan is a long-range, "direction-setting policy document that is intended to serve as a guide to help plan and improve the physical environment and quality of life for the people of Kauai, and to address the overall development of the island. This document also presents the County's vision for Kauai and establishes the strategies to help achieve that vision." The first General Plan was adopted in 1971 and subsequently updated in 1984 and 2000. The Planning Department currently is conducting a series of technical studies to support the upcoming General Plan Update planning process.

The General Plan Land Use Map, shown in **Figure 7**, indicates the general distribution of various land uses on the island. The land use designations and their associated acreage for the island are listed in **Table 11**:

Table 11 – General Plan Land Use

Land Use	Acreage*	% of Total
Agricultural	80,019	23
Military	2,046	1
Open	256,223	72
Park	1,014	<1
Residential Community	10,044	3
Resort	2,239	1
Transportation	968	<1
Urban Center	2,640	1
Total	355,193	100

*Estimate – County of Kauai Planning Department, GIS Data

Although the General Plan is more detailed than the State Land Use classification, the land use designations are broad. In addition, since the General Plan is a direction-setting policy document and not a legal instrument, it does not provide specific density guidelines. It is proposed, in the absence of specific density guidelines in the General Plan, that County Zoning guidelines be applied to General Plan land use designations in order to determine full build-out water demand, as described below.

The General Plan provides only a broad density guideline of 1 to 20 units per acre for the Residential Community designation. Applying a uniform density of 1 unit per acre or 20 units per acre to all lands designated as Residential Community results in full build-out water demand of 5 MGD or 100 MGD, respectively. Instead of using either extreme for the density of units on lands designated as Residential Community, using an intermediate density is proposed. Under the assumption that most residents would like their communities, including the development density, to remain similar in the future, it is proposed that, for each Aquifer System, the intermediate density be calculated from the weighted average of the density of lands zoned as Residential by County Zoning. The weighted average density is calculated by dividing the total number of units allowed in the Aquifer System's Residential zones according to County Zoning by the total land area of Residential zones in that Aquifer System.

The General Plan does not provide a density guideline for the Resort land use designation. Therefore, similar to the approach proposed for Residential Community, it is proposed to use the weighted average

density of lands zoned as Resort by County Zoning in each Aquifer System to estimate full build-out water demands.

The General Plan acknowledges that dwellings are allowed on lands designated as Agricultural and Open, but does not provide a specific density guideline. It is proposed that the regulations placed on lands zoned as Agricultural and Open by County Zoning be applied to the lands designated as Agricultural and Open by the General Plan.

The full build-out water demand based on the General Plan is proposed to be used to determine if there are adequate water resources to sustain the long-range land use vision adopted by the County.

iii. Kauai County Development Plans

A development plan is "intended to direct physical development and public improvements within a specific geographic area of the County within the framework of the General Plan." Development plans establish more detailed policy than the General Plan and range in scope and timeframe. Not every community needs or desires a development plan since some communities may not require more specific, detailed policy than what is established in the General Plan. Development plans do not provide comprehensive coverage over the County of Kauai and may not provide enough detail for full build-out water demand. However, full build-out water demand will consider the development plans where sufficient detailed information is provided.

iv. Kauai County Zoning

The Comprehensive Zoning Ordinance (CZO) is the County's legal instrument that regulates land development, and implements the General Plan policies; therefore, zoning must be consistent with the General Plan. The zoning districts with associated acreage for the island are shown in **Figure 8** and listed in **Table 12**:

Table 12 – County Zoning

County Zoning Districts	Acreage *	% of Total
Agricultural	70,022	20
Commercial - General	588	<<1
Commercial - Neighborhood	124	<<1
Conservation	193,585	55
Industrial - General	1,183	<1
Industrial - Limited	231	<<1
No Zone	24,648	7
Open	56,325	16
Residential	7,615	2
Resort	625	<<1
Special District	232	<<1
Total	355,178	100

* Estimate – County of Kauai Planning Department, GIS Data

County Zoning is more detailed and precise than the General Plan. The Residential and Resort designations specify the minimum building site area required for each unit. Accordingly, County Zoning addresses existing conditions and shorter range planning; and the potential full-build out development based on zoning typically would be assumed to be less than the full build-out based on the General Plan.

The full-build out water demand based on County Zoning would be used to determine if there are adequate water resources to sustain the level of development that is allowed by law.

c. Additional Information to Refine Projections

The Framework recommends that forecasts from the most recent *State Water Projects Plan* (SWPP) and the *Agricultural Water Use and Development Plan* be used to refine the projections. More recent information is available from the ongoing SWPP updates (DHHL and State-wide), State agencies, and the *County of Kauai Important Agricultural Lands Study*; therefore, this more recent information will also be used to refine the projections. The Framework also recommends that forecasts of water requirements from federal and private sector purveyors be incorporated. Information on federal and private water systems will be gathered as practicable to further refine projections.

i. State Water Projects Plan

The *State Water Projects Plan* (SWPP) dated February 2003 is a water development plan specific to future State projects through the year 2020. The State projects, with the exception of lands owned by the Department of Hawaiian Home Lands (DHHL), generally conform to the County zoning (and therefore conform to the General Plan); consequently, the water projections for State projects, not including DHHL, are already accounted for in the WUDP proposed methodology. The DHHL projects will be addressed separately.

The SWPP indicates that, "Hydrological sectors with unmet SWPP water demands of 1.0 mgd or greater will be recommended for State source development. It is anticipated that County water systems will be able to supply the balance of State water demands in all hydrological sectors." Therefore, the WUDP is proposed to indicate State source development to meet State project water demands of 1.0 mgd or greater. Coordination between appropriate State agencies and the County will be continued to cooperatively and jointly develop future source requirements, and to provide for more expeditious and efficient utilization of government resources whenever possible.

The State-wide SWPP update is in progress, and the WUDP update will be coordinated to incorporate the best available information.

ii. State Department of Hawaiian Home Lands

The *Kauai Island Plan* dated May 2004 provides recommendations for future use of Department of Hawaiian Home Lands (DHHL) and is based on a 20-year planning period. Although the plan is originally dated May 2004, DHHL recognized the plan as current in 2012; therefore, the planning period is from 2012-2032. **Figure 9** shows DHHL Kauai lands. Currently, DHHL lands are primarily zoned for agriculture; however DHHL is exempt from State and County land use classifications. DHHL determines the land use classification for its lands and the County Planning Department modifies its zoning map and Land Use accordingly. These modifications and coordination are ongoing.

The SWPP update for DHHL is in progress. The SWPP update methodology determines DHHL water needs based on the *Kauai Island Plan* and supplemental information from DHHL, and does not consider existing County zoning. Available information from the SWPP for DHHL will be included and allocated to the appropriate

aquifer sectors. Proposed water development strategies, which generally rely on historically available water resources whenever possible, will be addressed. The land use classification with associated acreage from the *Kauai Island Plan* is listed in **Table 13.** **Tables 11** and **12** do not account for DHHL lands; the DHHL areas were subtracted from the appropriate land use classifications and are not included in the acreage reflected in **Tables 11** and **12.**

Table 13 – Department of Hawaiian Home Lands – Kauai Lands
Summary of Existing and Proposed Land Use Designations

Land Use Designation	Waimea (Acres)	Kekaha (Acres)	Hanapepe (Acres)	Wailua (Acres)	Kapaa (Acres)	Anahola (Acres)	Moloaa (Acres)	Total (Acres)	%
Residential	202	39	168	216	0	565	0	1,190	5.79
Subsistence Agriculture	214	0	158	99	0	533	200	1,204	5.85
Supplemental Agriculture	0	0	0	0	0	0	0	0	0.00
Pastoral	475	0	0	0	0	148	0	623	3.03
General Agriculture	12,527	0	0	52	1	1,018	86	13,684	66.54
Special District	1,258	13	0	92	0	1,419	30	2,812	13.67
Community Use	42	0	22	20	0	127	0	211	1.03
Conservation	343	0	0	0	0	350	0	693	3.37
Commercial	0	0	17	47	0	68	0	132	0.64
Industrial	0	0	0	0	16	0	0	16	0.08
TOTALS	15,061	52	365	526	17	4,228	316	20,565	100.00

Source: *Kauai Island Plan*, May 2004

iii. Agricultural Water Use and Development Plan

According to the Framework, "the major objective of the AWUDP is to develop a long-range management plan that assesses state and private agricultural water use, supply and irrigation water systems. The plan shall address projected water demands and prioritized rehabilitation of existing agricultural water systems." The AWUDP dated December 2003 (revised December 2004) is limited in scope due to time and funding constraints and assesses the needs and proposes improvements for the East Kauai irrigation system (IS), Kauai Coffee IS, Kekaha IS, and Kokee Ditch IS.

More recent, comprehensive information on agricultural lands is available in the *County of Kauai Important Agricultural Lands Study* and is relied upon as the best available information for agricultural water demand estimates. The DOA is currently updating the AWUDP, and its information will supersede the agricultural water use information included in this WUDP when it becomes available.

iv. County of Kauai Important Agricultural Lands Study

The purpose of the *County of Kauai Important Agricultural Lands (IAL) Study* is to operationalize the County-specific directives of Act 183 (SLH 2005) Important Agricultural Lands. According to Act 183, IALs are lands that are capable of producing sustained high yields when treated and managed according to accepted farm methods and technology, contribute to the State's economic base and produce agricultural commodities for export or local consumption, and are needed to promote the expansion of agricultural activities and income for the future, even if currently not in production. Act 183 also includes eight criteria for identifying IALs. The study, conducted from 2009 to 2011, evaluated Kauai's agricultural lands for these eight IAL criteria. Agricultural lands that met all eight criteria to some degree received a score of 28. The County of Kauai is in the process of determining which lands based on their score, size, and other factors will be recommended for IAL designation. Only a subset of lands with a score of 28 or better is expected to be designated as IALs.

It is not reasonable to assume that all lands designated or zoned as Agricultural will be fully irrigated at all times. Therefore, it is proposed that the diversified water use rate of 3,400 gallons per acre per day (gpad) estimated in the 2004 AWUDP be applied only to

agricultural lands that have received a score of 28 or better in the IAL study.

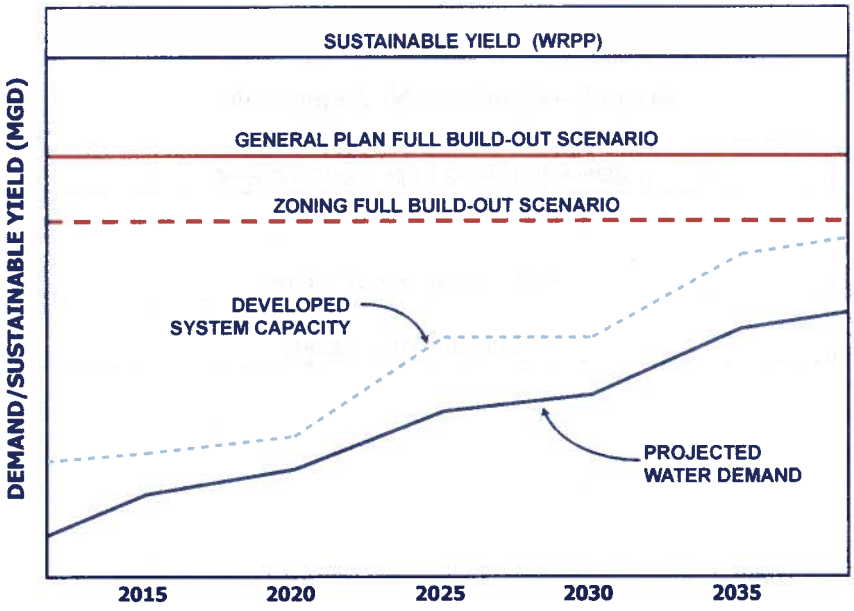
v. Federal and Private Water Systems

Federal water system managers and private water system owners will be queried on the existing populations served and water production capabilities of their systems, as well as future projections if available.

E. Develop Master Plan Level Resource and Facility Recommendations

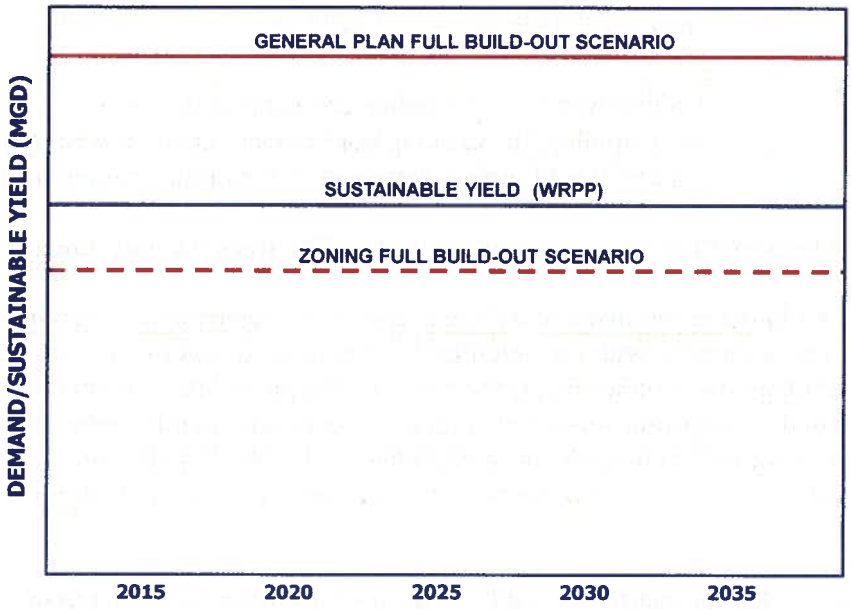
The full build-out water demand will be evaluated to determine the sustainability of the water needs associated with the potential full build-out development that is allowed by the current land use policies set by the State of Hawaii and the County of Kauai, and will be evaluated to determine master plan level resource and facility needs and options. Available information from the on-going State-wide SWPP update and DHHL SWPP update, and AWUDP will be incorporated. **Graph 3** depicts an ideal theoretical example.

Graph 3 – Sustainability of Land Use Policies & Meeting Projected Demands

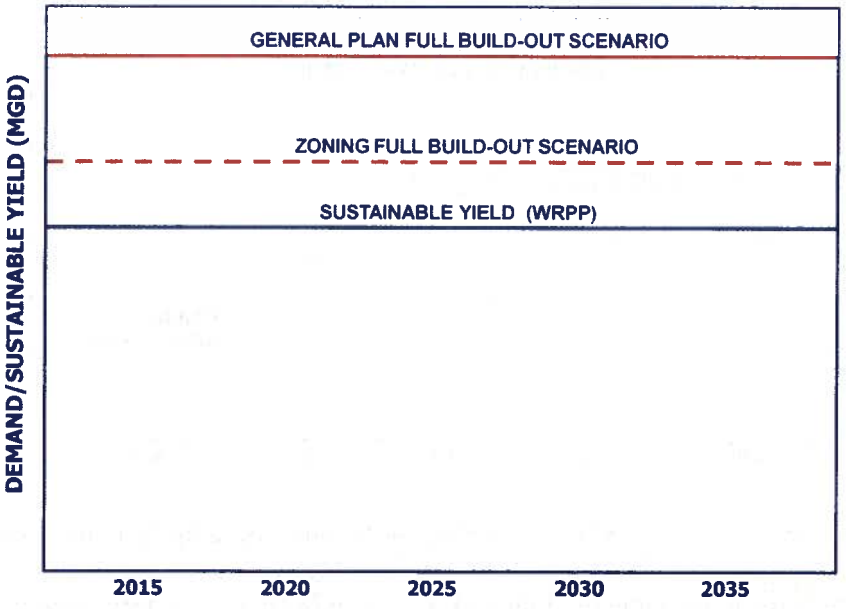


Graphs 4 and **5** show possible theoretical situations where the land use based water demands may exceed the aquifer sector sustainable yield indicating that the County should reevaluate the General Plan and/or zoning in light of water resource limitations. These areas likely would be deemed sensitive and recommended for more detailed assessment.

Graph 4 – Unsustainable General Plan Policy



Graph 5 – Unsustainable Zoning Policy



The proposed process to develop master plan level resource and facility recommendations is described below:

1. Use the highest quality of water for the highest beneficial use.

   The general approach proposed for development of the master plan level resource and facility recommendations assumes that ground water sources will primarily be used as potable drinking water for human consumption, while existing surface water diversions, water conservation, and reclaimed water will be used for agricultural irrigation.

2. Evaluate water source adequacy and determine source development requirements.

   The ability of existing water resources to meet future demand projections will be evaluated to determine source development requirements. Available information on the capacity and integrity of existing water resources are intended to be assessed.

3. Evaluate conventional water infrastructure capabilities.

   Conventional water infrastructure capabilities, including the extents of existing distribution systems, are proposed to be evaluated to determine their ability to meet future demand projections.

4. Promote and expand water conservation programs.

   Water conservation options, including watershed management, will be considered as carefully as other resource options. Existing water conservation programs should be identified and promoted, and proposed water conservation measures should complement existing programs. Watershed management efforts should include protecting watershed areas to ensure sufficient recharge of ground water aquifers and protecting the quality of ground water and surface water.

5. Explore alternative water sources.

   Alternative water sources are proposed to be explored. These alternative measures include rainwater catchment systems, wastewater reclamation and desalination. While alternative sources may not be able to completely provide enough source water to meet demand, alternative water sources should be developed to augment naturally occurring water supplies. Alternative water sources should be developed not only to help meet future demand projections, but also to help ensure the long-term viability of ground water and surface water sources.

6. Explore development of additional conventional water sources.

   The development of ground water and surface water sources will be evaluated. The development of ground water and surface water sources is proposed to be considered after first considering conservation options and alternative water sources.

7. Evaluate resource options and recommend a strategy.

   A water resource strategy is defined as a flexible sequence of supply, infrastructure, storage, and conservation program additions intended to meet county water needs. Conservation options and conventional and alternative water resource options are proposed to be evaluated to determine the recommended water resource strategy. Water supply reliability and quality, feasibility, environmental and cultural impacts, and water rights will be considered.

VI. IMPLEMENTATION PLAN

Water is a precious resource and is a high priority in land use decisions. An implementation plan for the Kauai WUDP will be developed to provide guidance for further integration of water resource management with the development of land use policies to ensure sustainable management of this vital resource. In accordance with the Framework, the implementation plan will be divided into 3 periods as practicable: near-term (initial 5 years), medium-term (subsequent 5 years), and long-term (final 10 years). Applicable information on the DOW Capital Improvement Projects and from the Water Plan 2020 will be incorporated.

VII. STAKEHOLDER AND PUBLIC INVOLVEMENT

Substantial and credible stakeholder involvement is critical to the success of the County WUDP. Therefore, it is proposed to form a stakeholder advisory committee composed of key stakeholders representing various landowners, community and civic groups. The intent is for the stakeholder advisory committee to provide a comprehensive cross-section of the community and interested parties. Members of the stakeholder advisory committee will participate as active reviewers of the WUDP update. The primary purpose of the stakeholder advisory committee is to disperse information and act as a conduit or channel to the public. The committee will meet prior to the approval of the project description to CWRM and prior to the completion of the draft WUDP.

Concerned federal, state, and county agencies will be consulted, and their recommendations will be carefully evaluated. An inter-agency kickoff is proposed to introduce the WUDP update process to interested agencies.

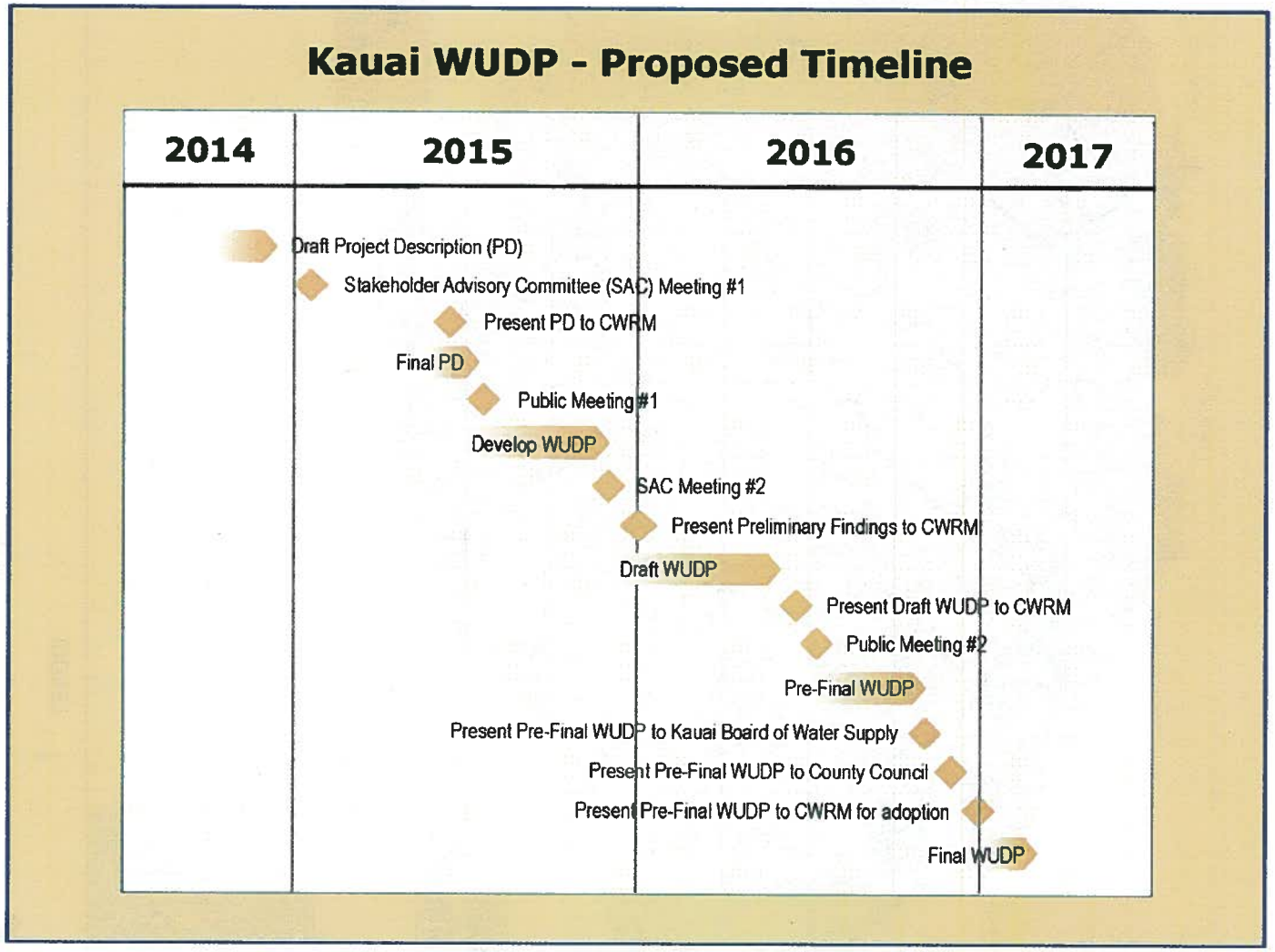
In addition to the stakeholder advisory committee, a series of public informational meetings are proposed to present findings of the update effort. More importantly, the meetings also will provide a forum to gather input on the development of the WUDP and will focus on recommendations from the public on the alternative water resource measures favored to meet growing demands. The meetings will be well-publicized. At a minimum, information about the meetings will be issued 7 to 10 days before the meeting to the newspaper, radio stations, and television stations, and posted on the DOW website (www.kauaiwater.org) and the County of Kauai website (www.kauai.gov). Additionally, the DOW's social media pages on Facebook (www.facebook.com/KauaiDOW) and Twitter (www.twitter.com/kauaiwater) may also be utilized for dissemination of information about the meetings. Information about the meetings will be distributed to the DOW public meeting email list and noted on DOW Board Meeting agendas. Public informational meetings will be held on the North, South, East, and West sides of the island after approval of the Project Description to inform the public of the WUDP update commencement and process. A second set of meetings is anticipated during development of the WUDP update report, followed by presentation to the general public when the draft WUDP is completed. Slideshow presentations will be utilized at the public meetings as a means of transmitting information.

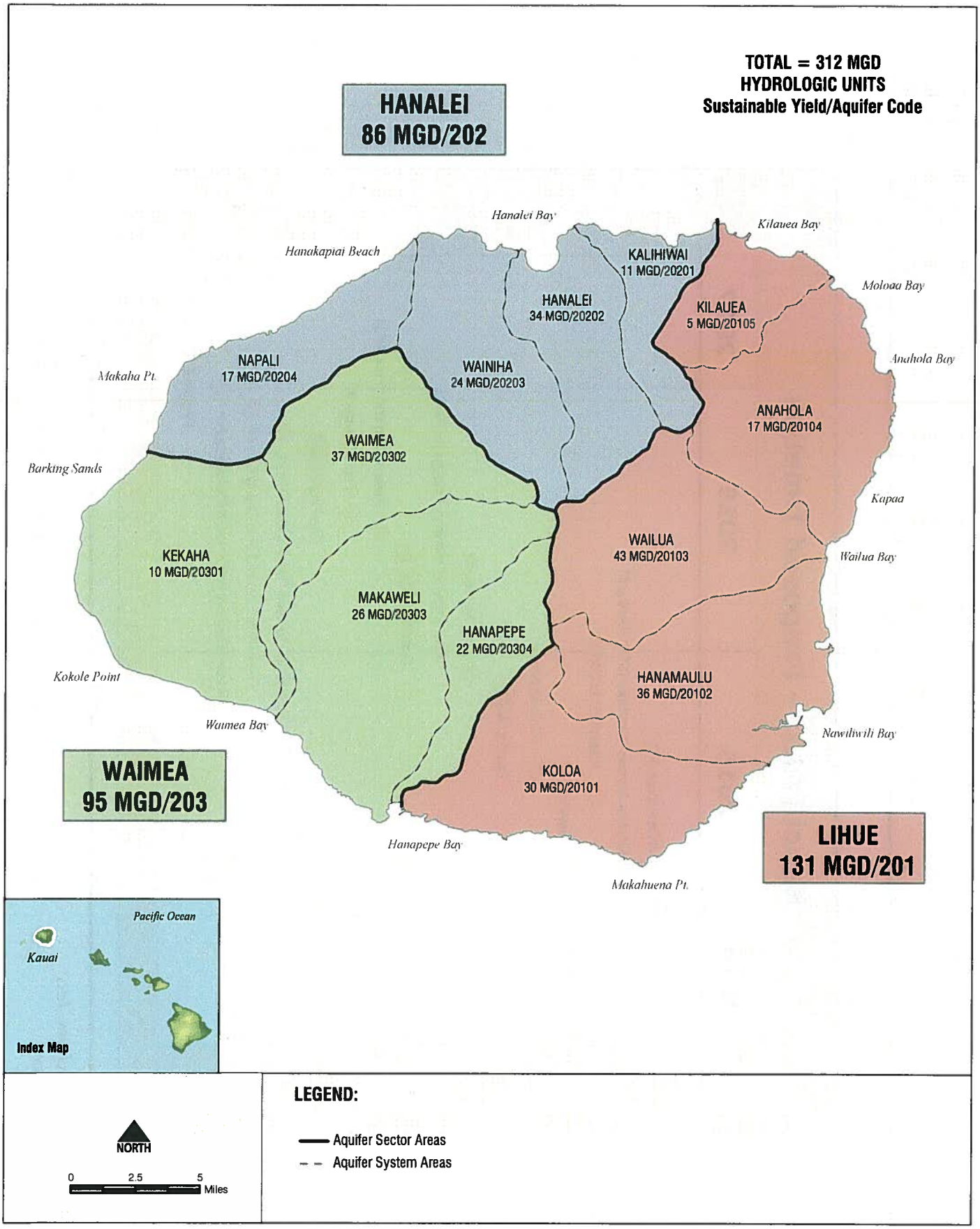
VIII. CURRENT WATER ISSUES

Current water issues will be tracked, and decisions for the WUDP will be made with awareness of these water issues. Current water issues include a petition to restore flow in the Waimea River, suspension of the Kahili Horizontal Directional Drilled Well project, and recent discussion regarding consideration of designating the Hanamaulu Aquifer System as a water management area. Climate change is an emerging issue, and specific impacts on water resources are unknown at this time. Kauai's freshwater resources depend heavily on rainfall; therefore, changes in annual rainfall or changes in the frequency and duration of droughts could affect ground water recharge and stream flow. Changes in temperature could affect the hydrologic cycle, especially evapotranspiration. Changes in the intensity, duration, and frequency of weather events may also impact water resources. Climate change adaptation strategies will be considered.

IX. UPDATING AND ADOPTION PROCESS

This Project Description initiates the process to update the WUDP for the County of Kauai, and notifies the CWRM of the County's intent and proposed technical approach. Periodic milestone briefings to the CWRM will be conducted throughout the preparation of the WUDP. The completed WUDP will be submitted to the Kauai Board of Water Supply for approval. Finally, the approved WUDP will go before the County Council, public and CWRM for final adoption. For a more detailed schedule, refer to the proposed timeline on the following page.


Kauai WUDP - Proposed Timeline
2014
2015
2016
2017
Draft Project Description (PD)
Stakeholder Advisory Committee (SAC) Meeting #1
Present PD to CWRM
Final PD
Public Meeting #1
Develop WUDP
SAC Meeting #2
Present Preliminary Findings to CWRM
Draft WUDP
Present Draft WUDP to CWRM
Public Meeting #2
Pre-Final WUDP
Present Pre-Final WUDP to Kauai Board of Water Supply
Present Pre-Final WUDP to County Council
Present Pre-Final WUDP to CWRM for adoption
Final WUDP

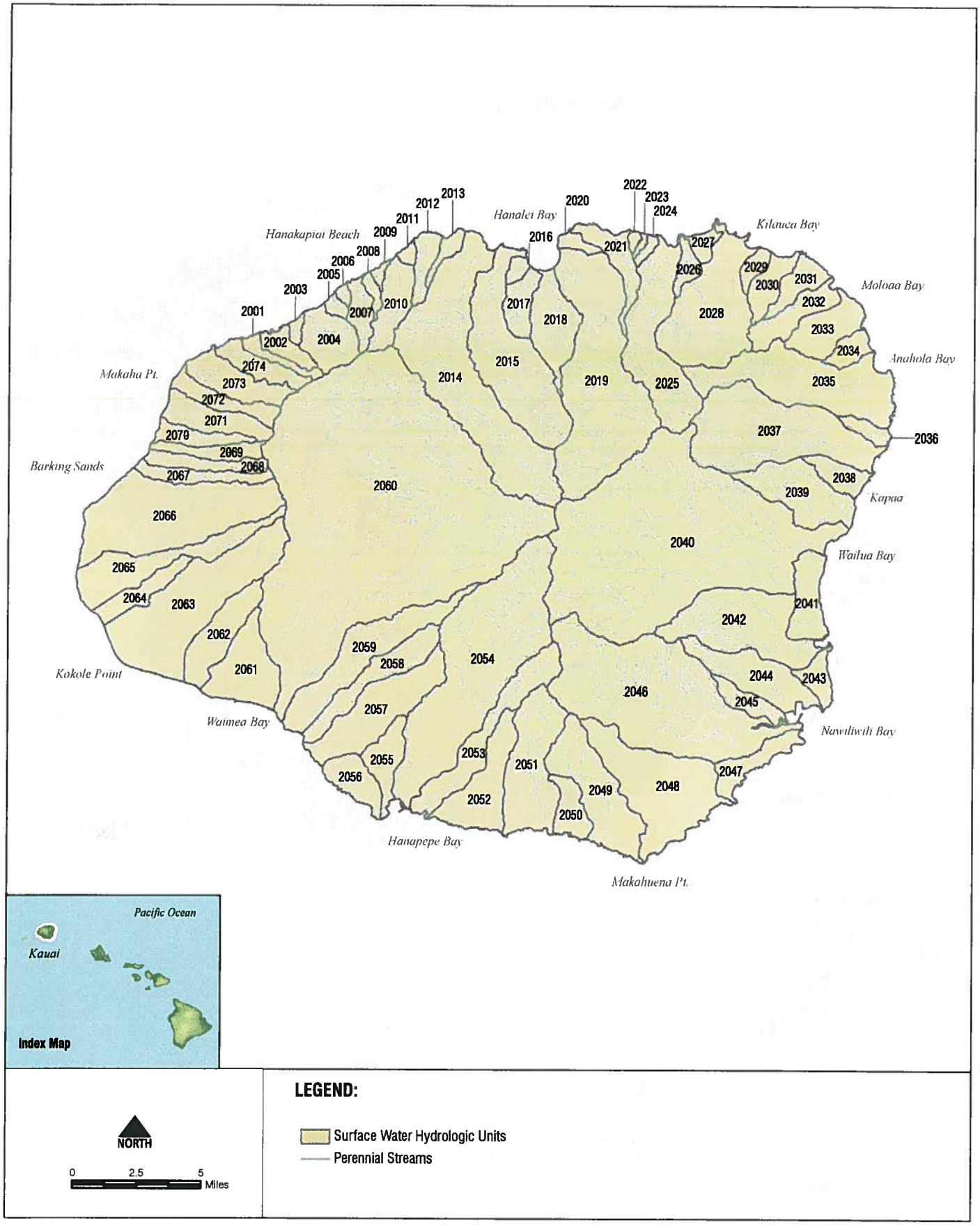


Kauai Water Use and Development Plan - County of Kauai

Ground Water Hydrologic Units and 2008 Sustainable Yield

FIGURE 1

Fukunaga & Associates, Inc.
Consulting Engineers

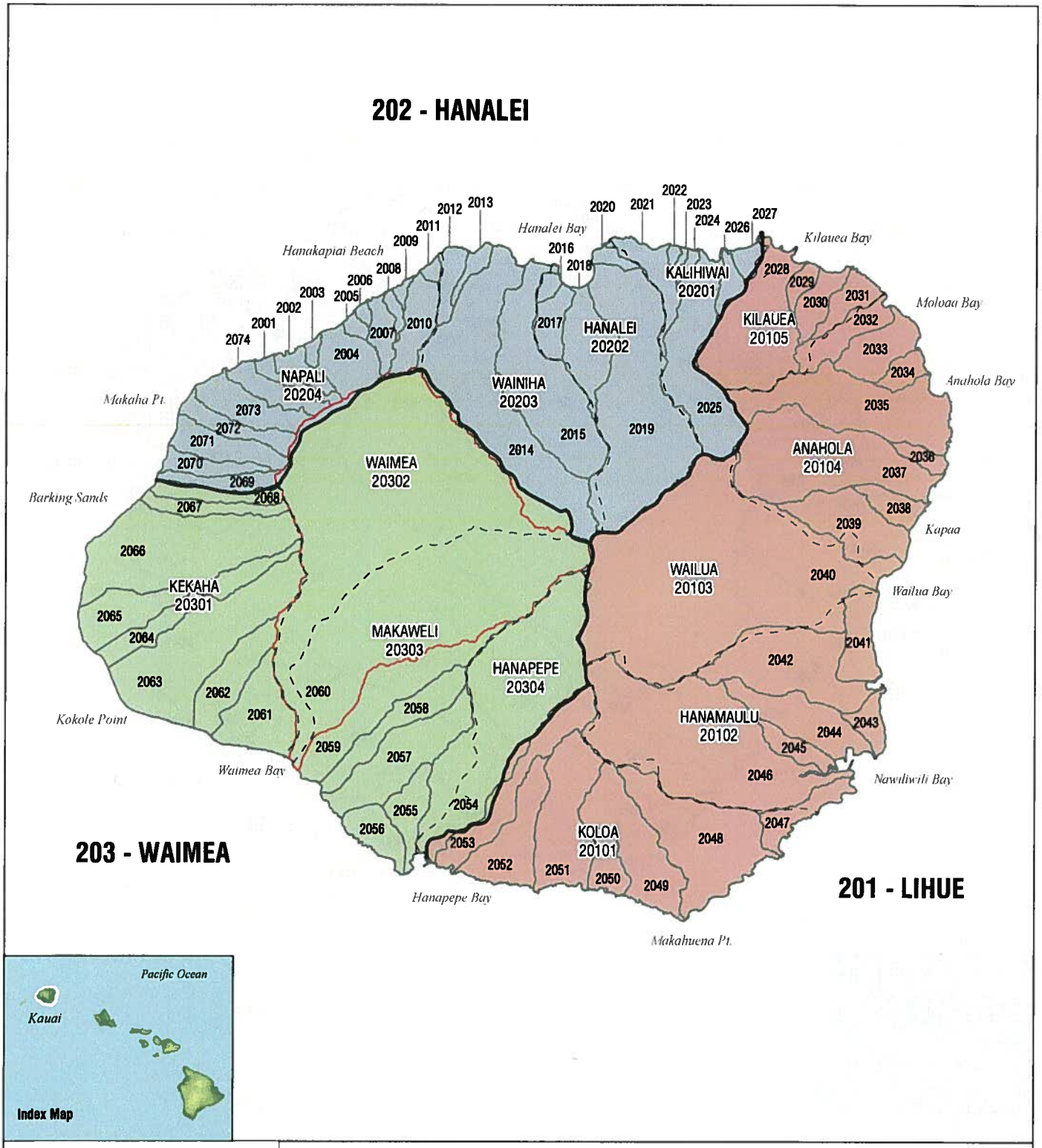


Kauai Water Use and Development Plan - County of Kauai

Surface Water Hydrologic Units

FIGURE 2

Fukunaga & Associates, Inc.
Consulting Engineers

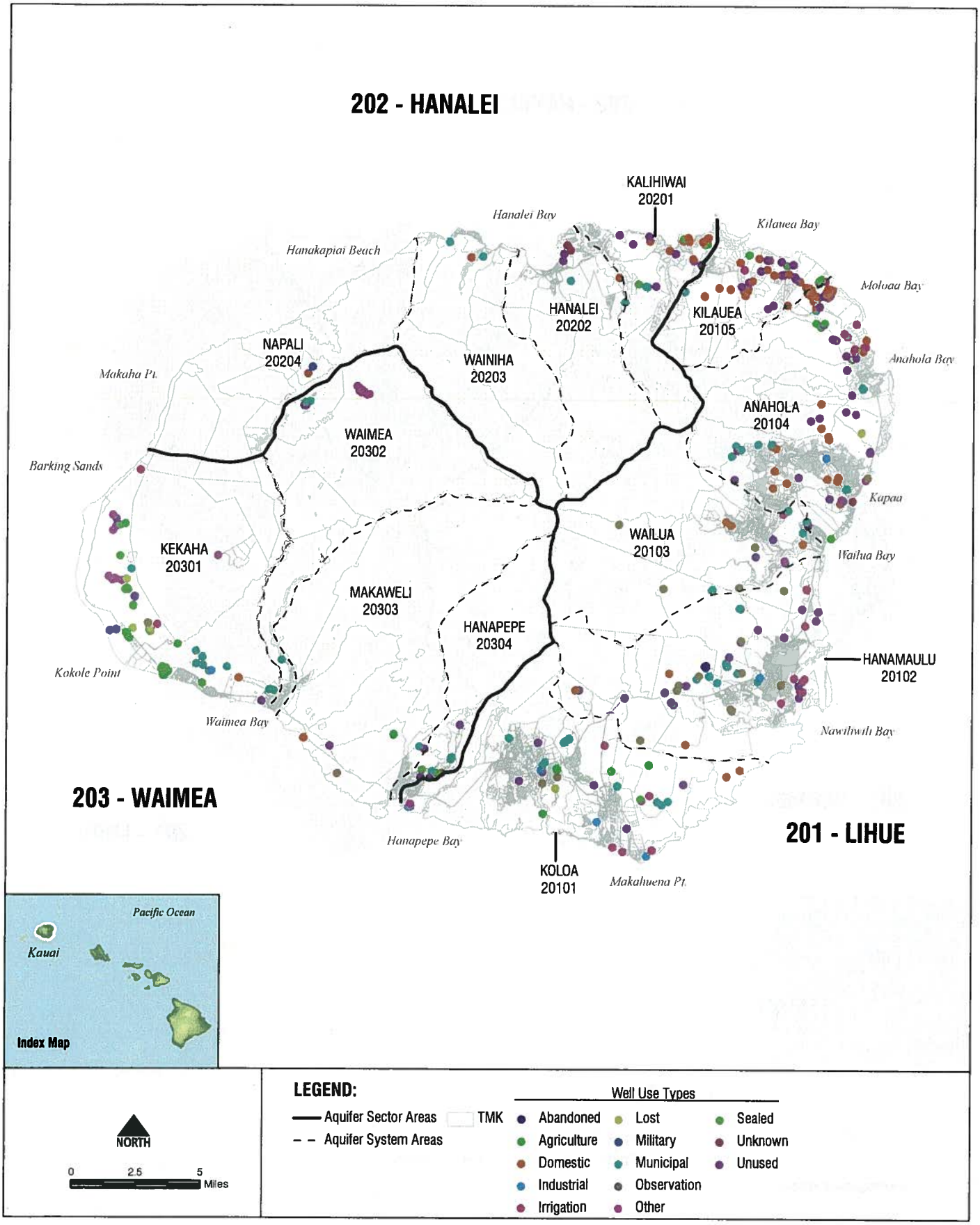


Kauai Water Use and Development Plan - County of Kauai

Aquifer Sectors and Systems and Surface Water Hydrologic Units

FIGURE 3

Fukunaga & Associates, Inc.
Consulting Engineers

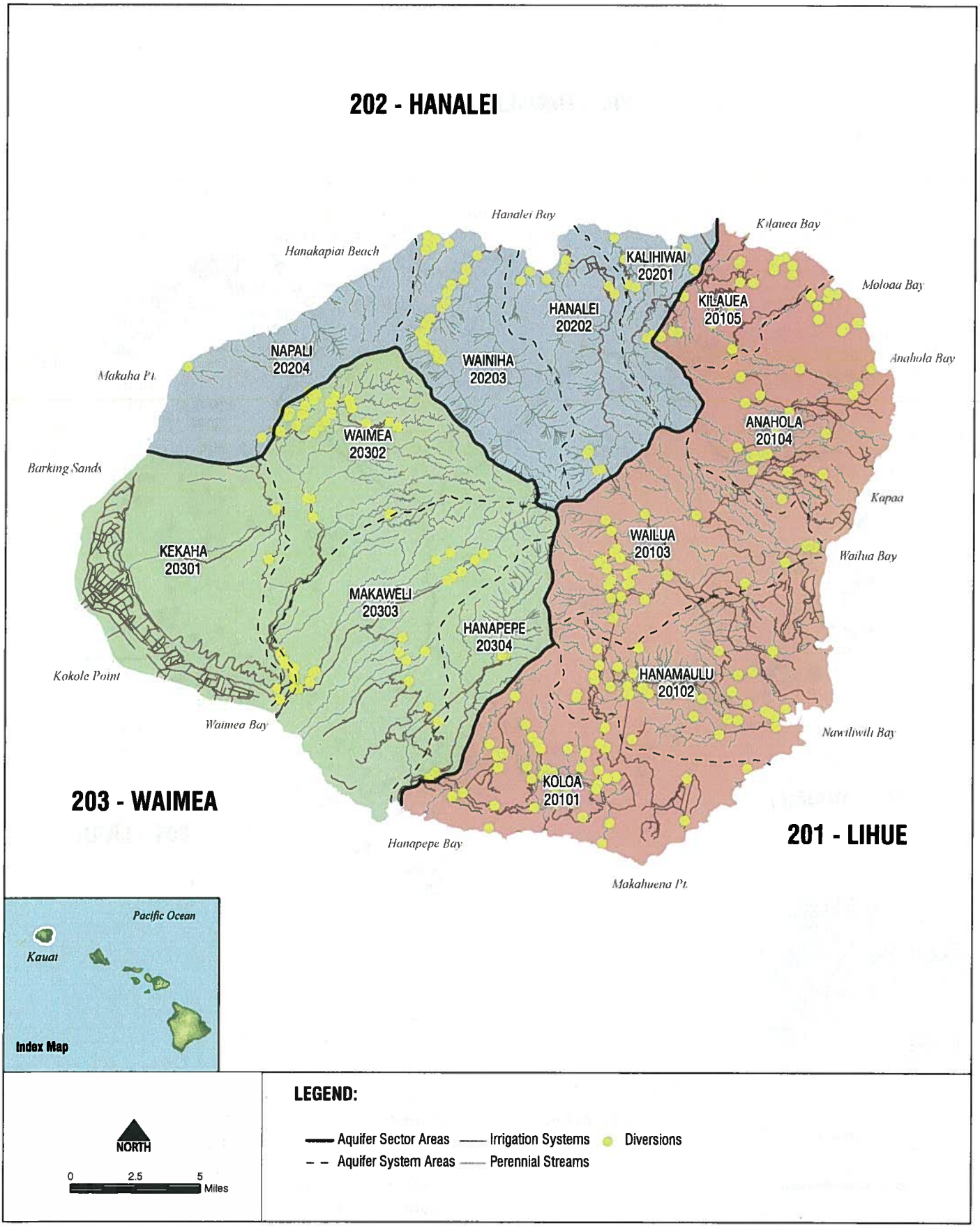


Kauai Water Use and Development Plan - County of Kauai

Registered Wells

FIGURE 4

Fukunaga & Associates, Inc.
Consulting Engineers

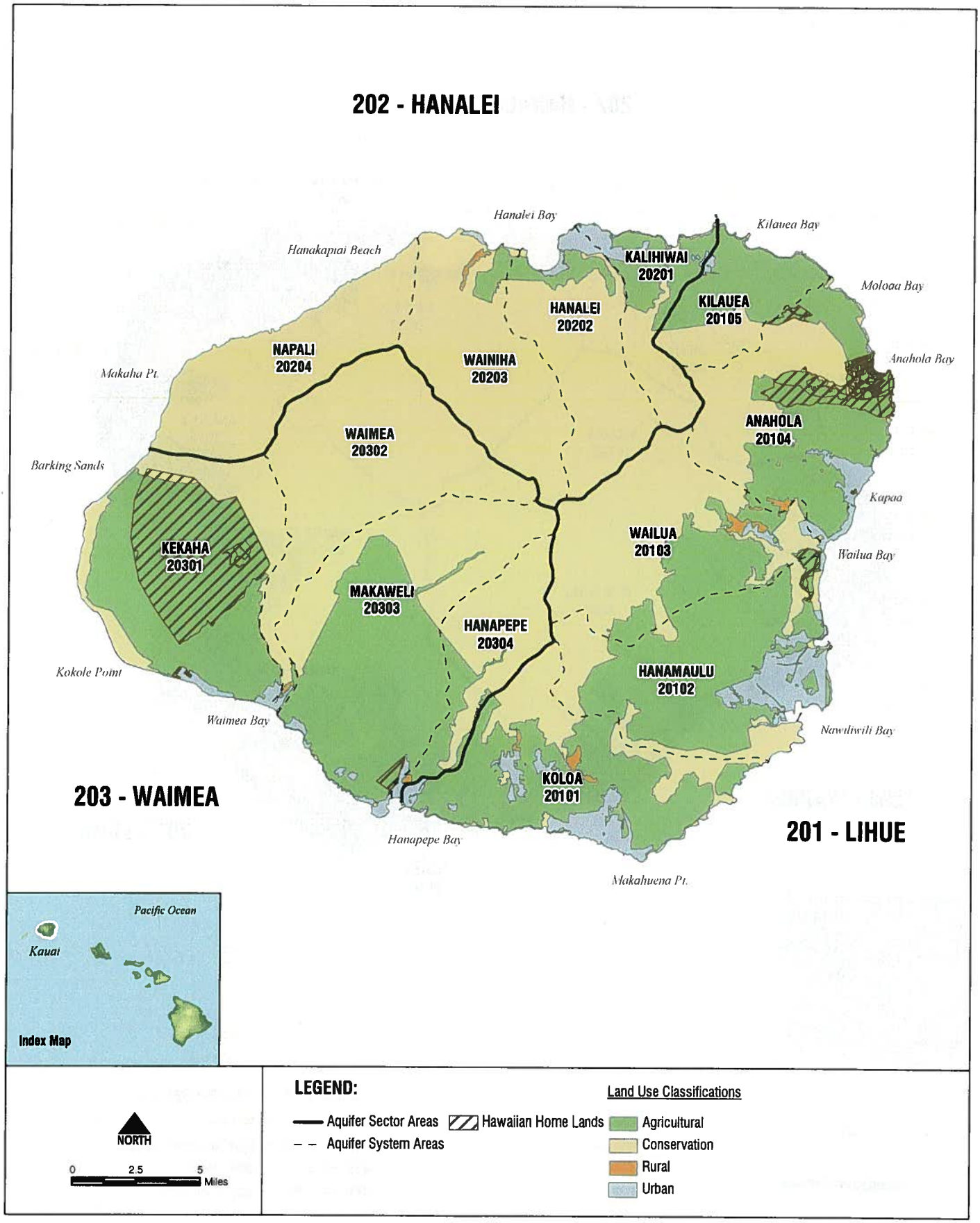


Kauai Water Use and Development Plan - County of Kauai

Stream Diversions

FIGURE 5

Fukunaga & Associates, Inc.
Consulting Engineers

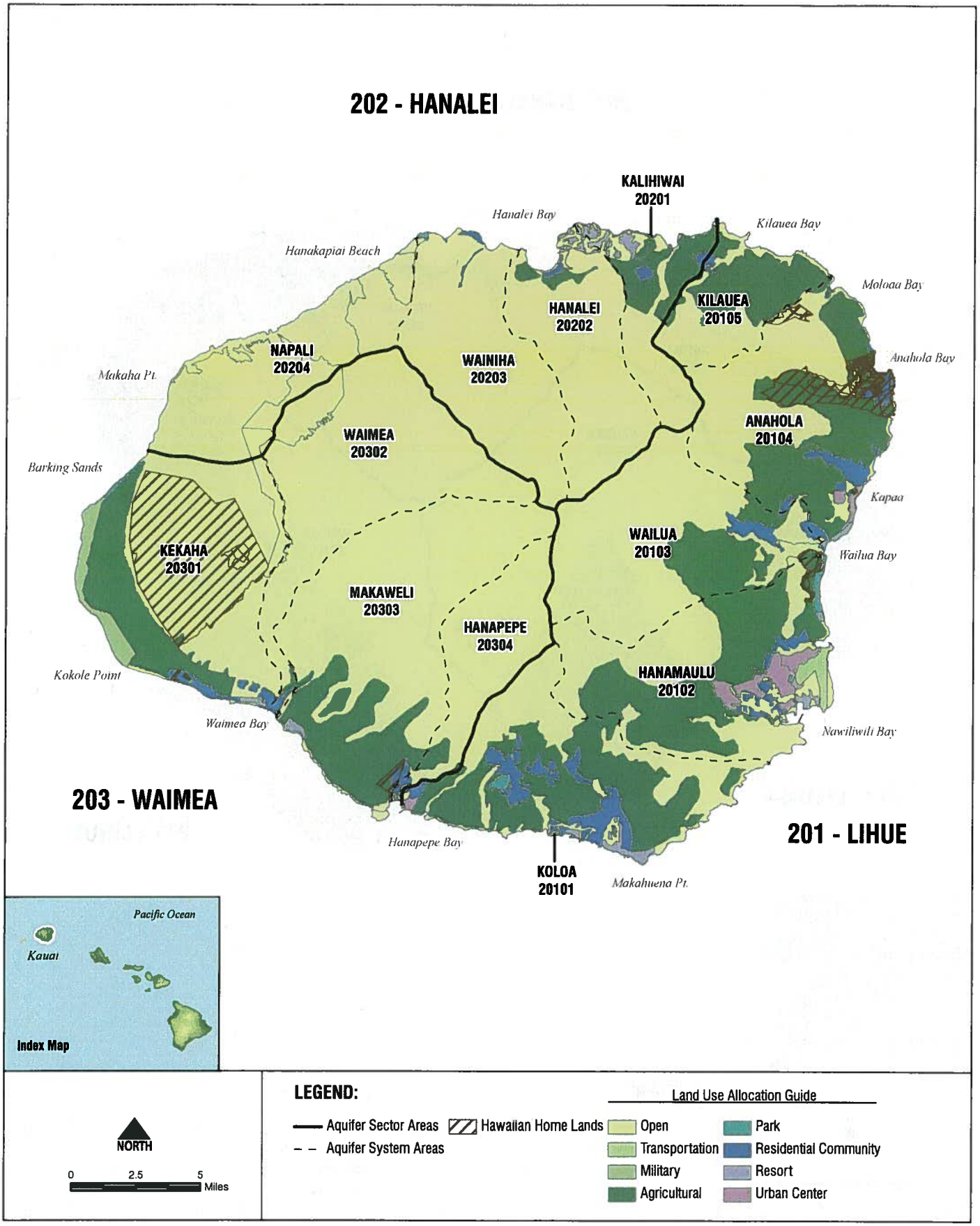


Fukunaga & Associates, Inc.
Consulting Engineers

Kauai Water Use and Development Plan - County of Kauai

State Land Use District Boundaries

FIGURE 6

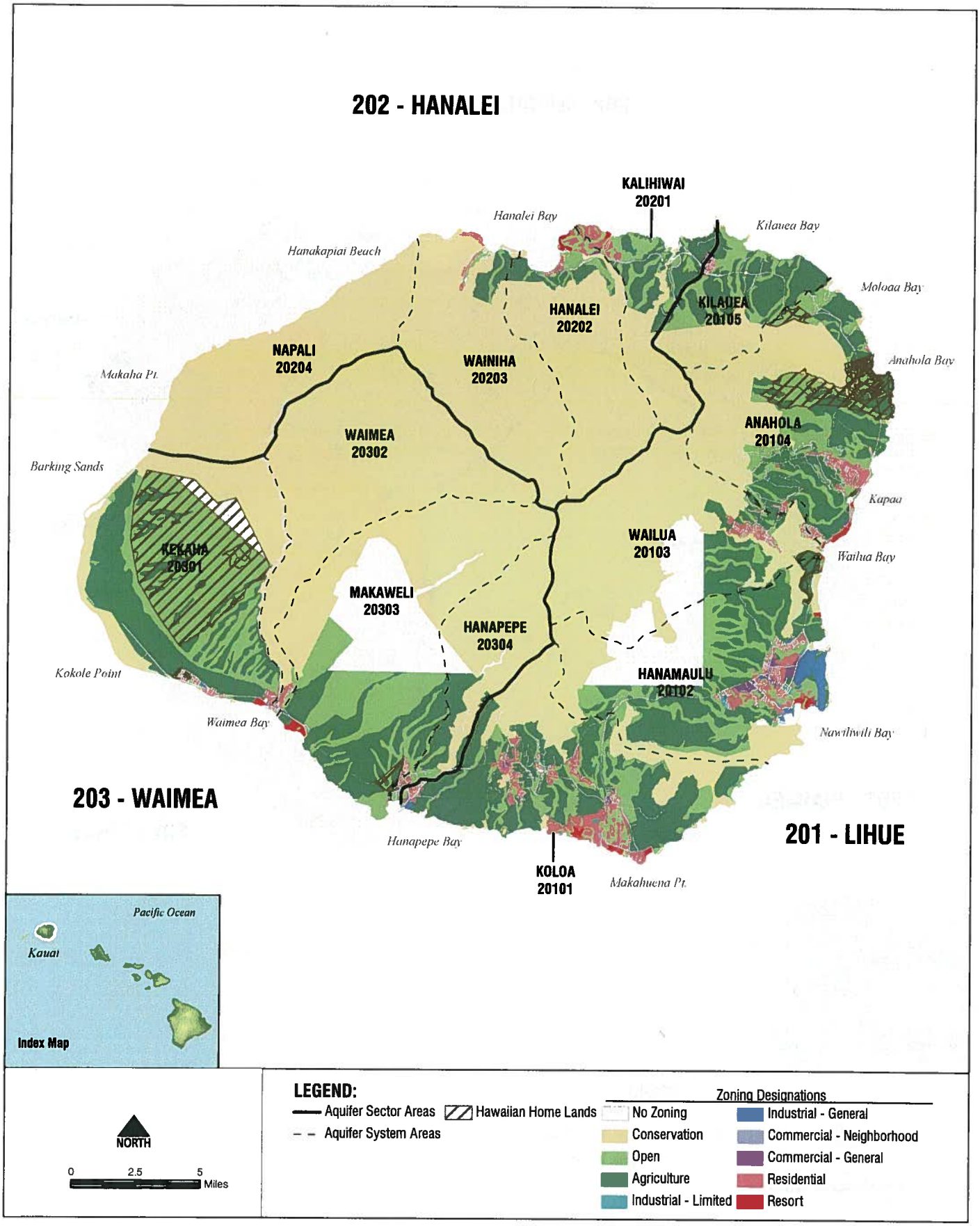


Kauai Water Use and Development Plan - County of Kauai

General Plan Land Use Map

FIGURE 7

Fukunaga & Associates, Inc.
Consulting Engineers

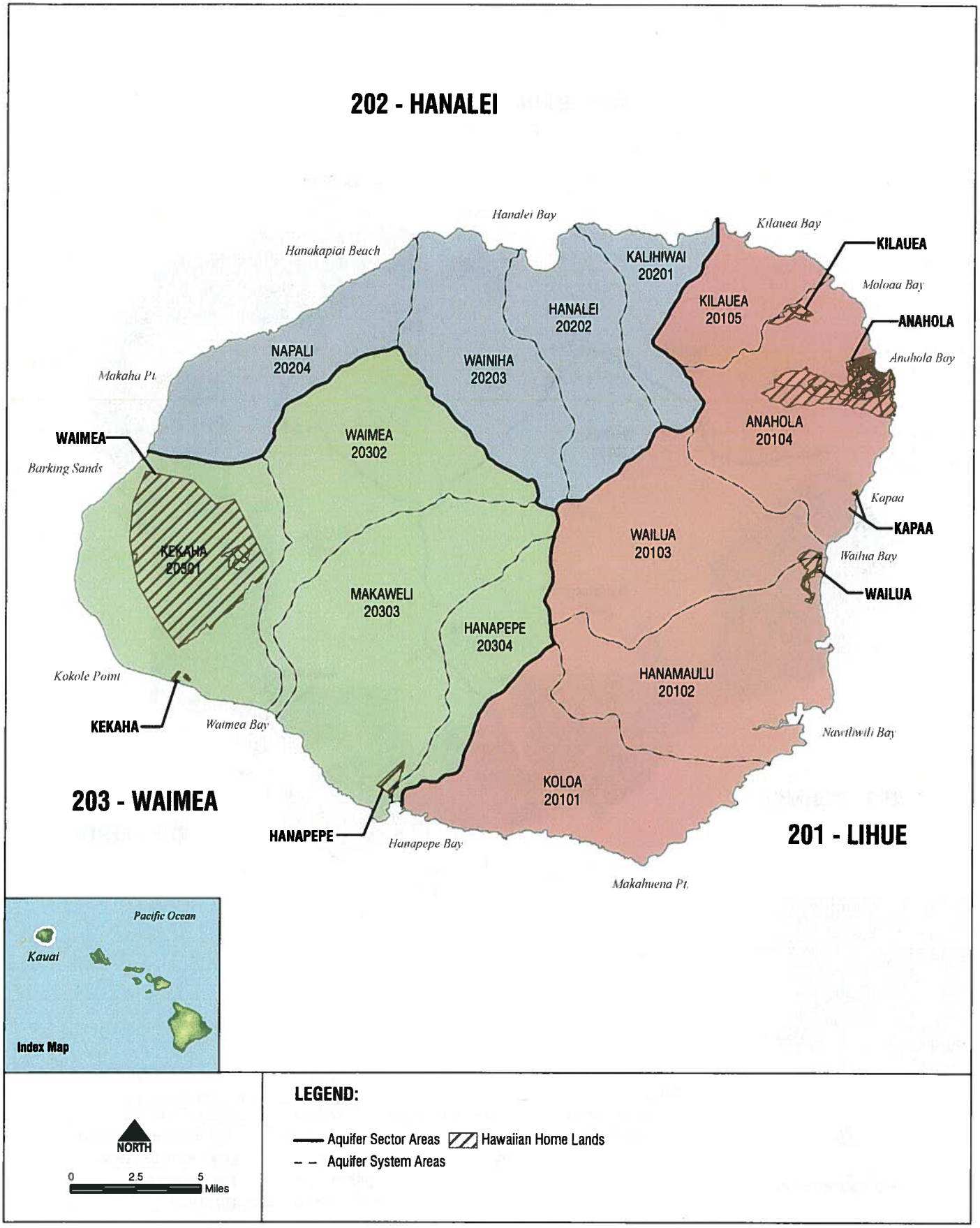


Kauai Water Use and Development Plan - County of Kauai

County Zoning Map

FIGURE 8

Fukunaga & Associates, Inc.
Consulting Engineers



Kauai Water Use and Development Plan - County of Kauai

Department of Hawaiian Home Lands - Kauai

FIGURE 9

Fukunaga & Associates, Inc.
Consulting Engineers