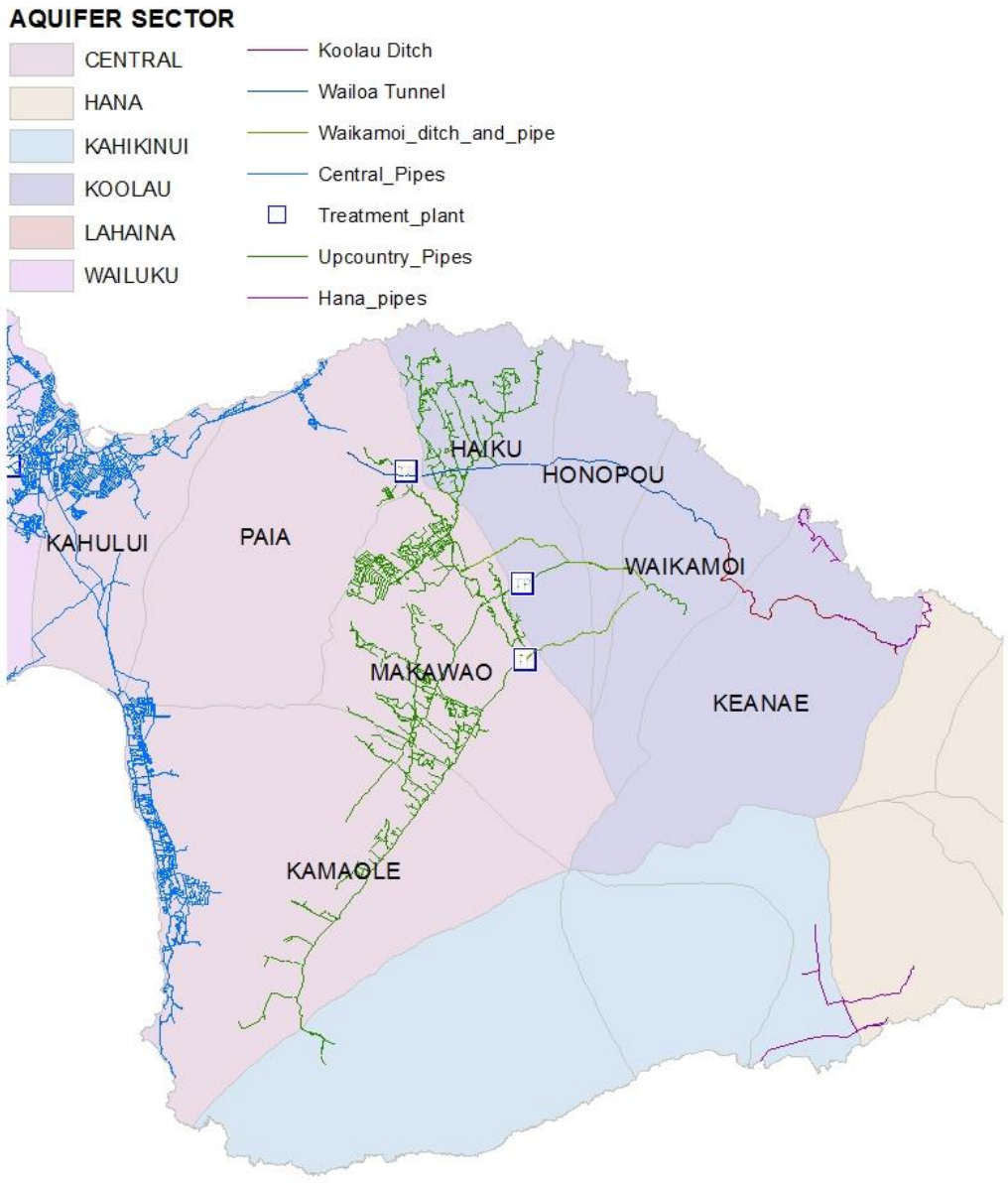
UPCOUNTRY REGION (CENTRAL AND KOʻOLAU AQUIFER SECTORS)

This is a synopsis of work in progress for the Central and Koʻolau aquifer sectors for further public input. Analysis is ongoing and the information below has not been reviewed by the Board of Water Supply, County Council or the State Commission on Water Resource Management. Preliminary findings are subject to change based on input and further analysis.

WATER SYSTEMS

The municipal Upcountry water system hydrologically links Paʻia, Kamaole, Makawao and Haʻiku aquifers with surface water from the Keʻanae, Waiakamoi and Honopou aquifer systems. Privately owned "public water systems" (systems serving more than 25 people or 15 service connections) use groundwater from the Haʻiku, Makawao and Paʻia aquifers. Domestic wells for individual household use tap water mostly from the Haiku and Honopou aquifers in the Koʻolau aquifer sector.



HOW MUCH WATER DOES THE UPCOUNTRY REGION HAVE?

Broken down by hydrologic units, the Upcountry region spans two aquifer sectors: the Central and Koʻolau sectors. The groundwater sustainable yield (SY) is the maximum rate that groundwater can be withdrawn without impairing the water source as determined by the Commission on Water Resource Management (CWRM). Sustainable yield accounts only for basal ground water and ignores significant importation of surface water into Kahului and Paʻia from outside the aquifer system area. This explains the ability to withdraw fresh water from the aquifer at significantly higher rates than the sustainable yield without apparent negative impacts (i.e. rising chloride concentrations or decreasing water levels).

Installed pump capacity is not the permitted pumpage, but the maximum capacity of the permitted well in gallons per minute multiplied by 24 hours. The pumpage reported to CWRM reflects actual periods of pumpage. However, not all active wells comply with reporting requirements and pumpage data is especially incomplete for smaller domestic and irrigation wells.

Agricultural irrigation and related use for sugarcane cultivation accounted for 57.3 mgd of the reported 59.5 mgd pumpage from the Kahului and Paʻia aquifers. Transfers of surface water from the Koʻolau aquifer sector contribute to recharge of these aquifers.

CENTRAL SECTOR	SUSTAINABLE YIELD mgd	INSTALLED PUMP CAPACITY mgd	REPORTED PUMPAGE mgd
Makawao	7	4.961	0.36
Kamaole	11	18.827	2.85
Kahului	1	102.121	29.99
Paʻia	7	153.728	29.50
TOTAL SECTOR SY	**26**	**279.637**	**62.72**
KOʻOLAU SECTOR			**2.85**
Keʻanae	83	1.148	0.06
Haʻiku	27	12.477	0.83
Honopou	25	0.689	0.01
Waikamoi	40	0	0
TOTAL SECTOR	**175**	**14.314**	**0.91**

GROUNDWATER TRANSFERS

Population centers in the Kahului and Kamaole aquifer systems, including Kihei, Wailea and Makena, are served by groundwater originating in the Wailuku aquifer sector. 12 mgd of non agricultural use in the Kihei, Wailea and Makena region are transferred from the ʻIao and Waiheʻe aquifers.

SURFACE WATER TRANSFERS

Surface water from the Koʻolau aquifer sector is currently diverted for sugarcane cultivation and municipal uses. The instream flow standards (IFS), or the amount of water needed to remain in the stream, and the amount diverted is addressed in the East Maui Streams Contested Case. The hearings officer's Proposed Findings of Fact, Conclusion of Law, and Decision and Order was issued Jan. 15, 2016 and accounted for the irrigation needs for sugarcane cultivation. After Alexander & Baldwin Inc.'s

announcement to cease sugarcane cultivation after 2016, the contested case was ordered reopened on March 10, 2016 to address the change in HC&S business operations. The amount of "available" surface water for future use is dependent on IFS and established reasonable and beneficial off-stream uses. Surface water transfers from the Koʻolau sector to the Central sector for municipal use and the Kula Agricultural Park average 7.7 mgd. Surface water is treated at the Kamole Water Treatment Facility (WTF), the Piʻiholo WTF and the Olinda WTF. Less than 1 mgd of surface water from ʻIao stream in the Wailuku aquifer sector is transferred to the Central sector.

The table below shows the streams located in the Central and Koʻolau aquifer sectors and current diversions serving municipal uses and diversified agriculture (excluding sugarcane) in the Central sector.

Unit	Unit Name	Aquifer System	No. of Diversions	Interim Instream Flow Standards	County DWS Diversion	Municipal Service
6025	Kalialinui	Makawao	0	HAR §13-169-44		
6026	Kailua Gulch	Makawao	0	HAR §13-169-44		
6027	Maliko	Haiku	10	HAR §13-169-44		
6028	Kuiaha	Haiku	30	HAR §13-169-44		
6029	Kaupakulua	Haiku	15	HAR §13-169-44		
6030	Manawaiiao	Haiku	3	HAR §13-169-44		
6031	Uaoa	Haiku	6	HAR §13-169-44		
6032	Kealii	Haiku	4	HAR §13-169-44		
6033	Kakipi	Haiku	21	HAR §13-169-44		
6034	Honopou	Honopou	23	9-25-2008 - 2.31mgd below Haiku Ditch and 1.49 below taro diversions		Kamole WTF and Kula Ag Park
6035	Hoolawa	Honopou	37	HAR §13-169-44		
6036	Waipio	Honopou	15	HAR §13-169-44		
6037	Hanehoi	Honopou	12	9-25-2008 - 0.09 below Haiku Ditch on Huelo trib, 0.69 blw Haiku Ditch, 0.74mgd above community pipe, 2.21mgd at terminal waterfall		Kamole WTF and Kula Ag Park
	Puolua Stream	Honopou				Kamole WTF and Kula Ag Park
6038	Hoalua	Honopou	4	HAR §13-169-44		
6039	Hanawana	Honopou	5	HAR §13-169-44		
6040	Kailua	Honopou	6	HAR §13-169-44		
6041	Nailiilihaele	Waikamoi	12	HAR §13-169-44		
6042	Puehu	Waikamoi	1	HAR §13-169-44		
6043	Oopuola	Waikamoi	15	HAR §13-169-44		
6044	Kaaiea	Waikamoi	3	HAR §13-169-44		
6045	Punaluu	Waikamoi	1	HAR §13-169-44		

Unit	Unit Name	Aquifer System	No. of Diversions	Interim Instream Flow Standards	County DWS Diversion	Municipal Service
6046	Kolea	Waikamoi	8	0.13mgd at Hana Hwy		
6047	Waikamoi	Waikamoi	11	5-25-2010- 1.81mgd at Hana Hwy	Olinda and Piiholo WTFs	Kamole WTF and Kula Ag Park
6048	Puohokamoa	Waikamoi	8	5-25-2010 - 0.26mgd at Hana Hwy	Olinda and Piiholo WTFs	Kamole WTF and Kula Ag Park
6049	Haipuaena	Waikamoi	5	5-25-2010 - 0.06mgd at Hana Hwy	Olinda and Piiholo WTFs	Kamole WTF and Kula Ag Park
6050	Punalau	Waikamoi	3	5-25-2010 - HAR §13-169-44		Kamole WTF and Kula Ag Park
6051	Honomanu	Waikamoi	8	5-25-2010 - 0.00mgd at Hana Hwy	Piiholo WTFs	Kamole WTF and Kula Ag Park
6052	Nua'ailua	Waikamoi	2	5-25-2010 - 2.00mgd below Koolau Ditch		Kamole WTF and Kula Ag Park
6053	Pi`ina`au	Keanae	14	9-25-2008 - HAR §13-169-44		Kamole WTF and Kula Ag Park
	Palauhulu Stream	Keanae		9-25-2008		
6054	Ohia	Keanae	1	5-25-2010 - 2.97mgd at Hana Hwy		
6055	Waiokamilo	Keanae	18	9-25-2008 - 3.17mgd blw Koolau Ditch		
6056	Wailuanui	Keanae	8	9-25-2008 - 4.03mgd at Hana Hwy		Kamole WTF and Kula Ag Park
6057	West Wailuaiki	Keanae	1	5-25-2010 - 2.46mgd (wet) and 0.40mgd (dry) seasonal at Hana Hwy		Kamole WTF and Kula Ag Park
6058	East Wailuaiki	Keanae	1	5-25-2010 - 2.39mgd (wet) and 0.13mgd (dry)		Kamole WTF and Kula Ag Park
6059	Kopiliula	Keanae	2	5-25-2010 - - HAR §13-169-44. Temporarily amended to include SCAP MA-352 on Kopiliula Stream for the implementation of a Land Restoration Plan (11/20/2002)		Kamole WTF and Kula Ag Park
6059	Puakaa Stream	Keanae				Kamole WTF and Kula Ag Park
6064	Hanawi	Keanae	6	5-25-2010 - 0.06mgd at Hana Hwy		Kamole WTF and Kula Ag Park

CURRENT AND PROJECTED DEMAND

Two alternative methods were utilized to project water demand to the year 2035: Population growth rates and build out of permitted land use based on zoning and Department of Hawaiian Homelands land use plans.

Population Growth Rate Demand Projection

Population growth rate projections were applied in 5-year increments over the 20-year planning period from 2015 to 20135 for high, medium (base case) and low growth scenarios. Water consumption, including both public and private water systems, are compared to the incremental water needs for the next 20 years based on the *Socio-Economic Forecast Report 2014* (Draft September 2014) prepared by the Planning Department consistent with the Maui Island Plan. Existing demand for the base year 2014 reflects the average billed consumption over the calendar year. Billed consumption and treated water production (which includes unaccounted for losses) fluctuates up to 35% over the dry and wet seasons. Projecting a trend line of historic billed consumption and historic water production over ten years indicates the same pattern.

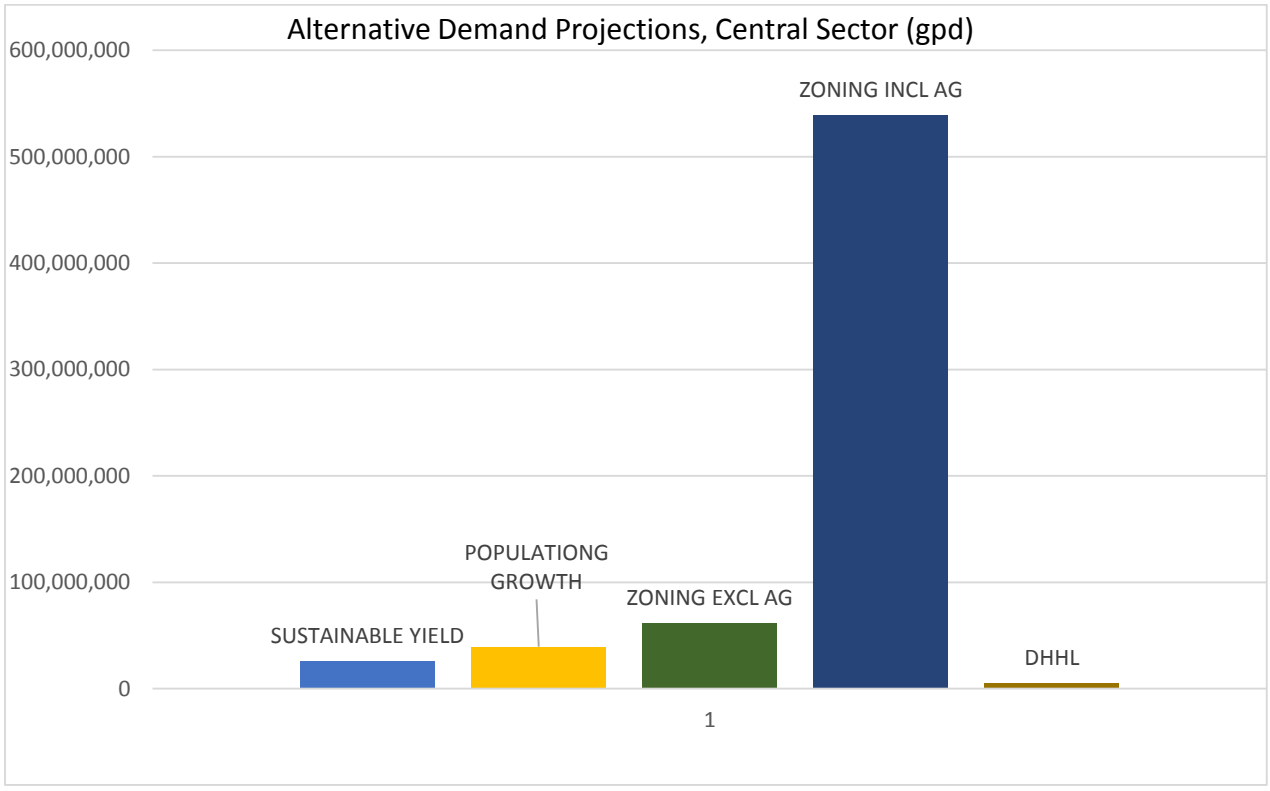
Water consumption and demand based on population growth rates do not account for large scale agricultural irrigation needs.

It was assumed that population growth, and thus water use, from projects described in the State Water Projects Plan and for the Department of Hawaiian Homelands are already accounted for by the population projections. Therefore, information from these documents was not used to further refine the 5-year incremental water demand projections.

In the 2014 Draft Forecast, high and low estimates are generated for key indicators by analyzing the gap between past projections and historic trends from 1990 to 2010. The high and low estimates project future scenarios, assuming that current projections include inaccuracies on the same scale as in the past. High and low alternative projections apply variance estimates for population, jobs, visitor units and average visitor census.

Land Use Based Demand Projection

Land use based demand projections reflect the potential full build-out applying current County Zoning designations and the Department of Hawaiian Homelands land use plan designations. The Zoning Code implements the General Plan policies and regulates existing and future land development at the parcel level. State Land Use classifications are too limited in guidance of various types of development permitted in each district. While Community Plans provide more detail they do not supply density guidelines, are outdated, and may be more useful as guidance for future Water Use and Development Plan updates. The County does not have zoning jurisdiction over the Department of Hawaiian Homelands lands and accordingly build-out under those plans was also applied.


Alternative Demand Projections, Central Sector (gpd)
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000
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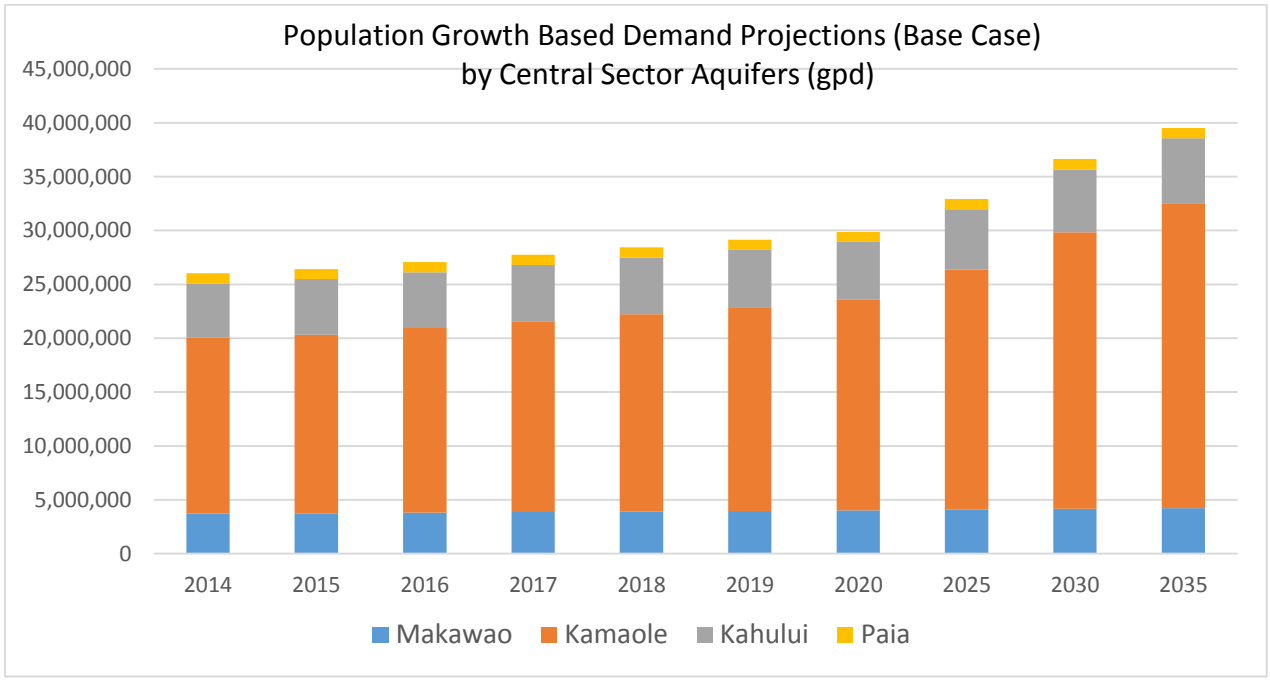
SUSTAINABLE YIELD
POPULATIONG GROWTH
ZONING EXCL AG
ZONING INCL AG
DHHL
1


Population Growth Based Demand Projections (Base Case)
by Central Sector Aquifers (gpd)
45,000,000
40,000,000
35,000,000
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2014
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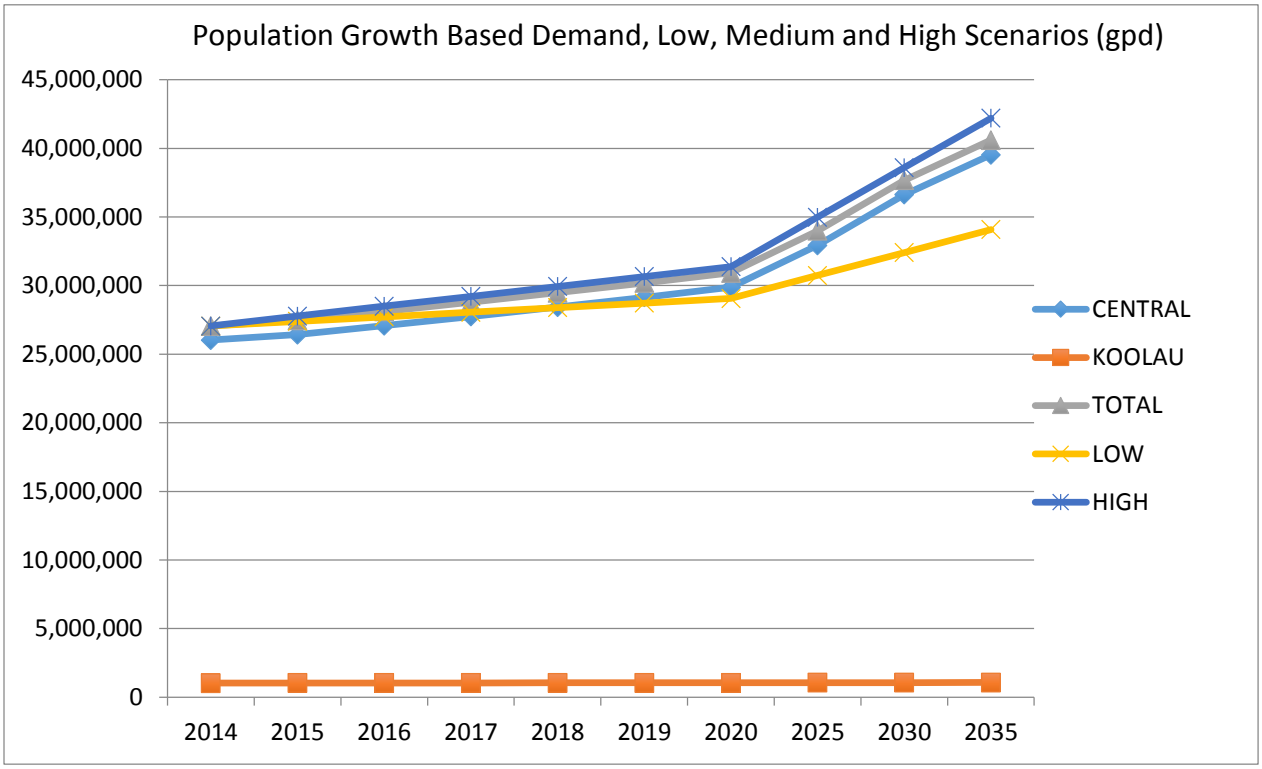
2018
2019
2020
2025
2030
2035
Makawao
Kamaole
Kahului
Paia



Upcountry Meter List

The County established the Upcountry Meter list of priority for service by the County water system when water supply became available. The list closed December 31, 2012, shortly after the adoption of the Maui Island Plan on December 28, 2012. There are about 1,800 requests for 4,300 meters (excluding those that did not accept a reservation offered, accepted a reservation, or where a meter was installed) for 1,900 dwelling units and a nominal number of commercial units. About one-third of the remaining requests are located outside the Urban Growth Boundary. Estimated consumption totals about 7.28 mgd.

DWS Ha'iku System	1.87 mgd
DWS Makawao System	0.87 mgd
DWS Upper Kula System	3.78 mgd
DWS Lower Kula System	1.53 mgd
DWS Kula Agricultural Park	Negligible

The Water Use and Development Plan projects demand based on projected population growth which reflects the policy and land use of the Maui Island Plan. The key issues for the Plan are identifying water sources to serve projected demand and policy for allocating water in a feasible manner consistent with the Maui Island Plan and planning objectives and other laws.

RESOURCE ADEQUACY

Water demand based on population growth rates in the Central sector would constitute 14 mgd of additional use for a total of 40 mgd by 2035. An additional 3-4 mgd would be needed to account for system losses, high growth years and other factors.

Full build-out of zoning designations and DHHL plans excluding agricultural zoned land would require an additional 34 mgd above current use.

Available groundwater within the Central sector and current ground and surface water transfer rates equate to 39 mgd. Hydrological and other constraints of available conventional resources within the sector are analyzed in the Strategy Options Matrix. Alternative resources to be considered include reclaimed wastewater, rainwater catchment, stormwater reuse, desalination, conservation, resource augmentation, and various regulatory and planning strategies. These are briefly outlined below.

OPTIONAL STRATEGIES

Rainwater Catchment

Rainwater catchment is the collection of rainwater from a roof or other surface before it reaches the ground. Rainwater catchment is not as reliable as conventional water resources because it is extremely sensitive to the climate. Rainwater catchment systems are not regulated by the Department of Health, making estimates of their use difficult. Scattered use occurs throughout East Maui where consistent rainfall makes the systems feasible as a domestic source. The only public water system supplied by catchment as a source is the Haleakalā National Park. No inventory of installed catchment systems throughout the island is available.

Reclaimed Wastewater

It is the policy of CWRM to promote the viable and appropriate use of recycled water provided it does not compromise beneficial uses of existing water resources. Reclaimed wastewater is a valuable resource, especially for irrigation purposes. Approximately 2.4 mgd of reclaimed wastewater is used on the island, primarily for irrigation of agriculture, golf courses and landscape.

An average of over 12 mgd of reclaimed water is produced at treatment facilities on Maui, while the design capacity is twice that volume. The reuse of wastewater from the Central Maui, Kihei, Lahaina, and other wastewater systems requires sufficient storage and distribution capability; otherwise, the excess is sent down injection wells. Community and agency concerns over effluent disposal continues to be a primary factor behind the County of Maui, Wastewater Reclamation Division's program since most of its wastewater reclamation facilities (WWRF) rely on injection wells.

The State of Hawai'i defines R-1 water as the highest-quality recycled water; it has undergone filtration and disinfection to make it safe for use on lawns, golf courses, parks, and other areas used by people. R-2 recycled water can only be used under restricted circumstances where human contact is minimized. R-1 is primarily used in West and South Maui. R-2 is used in Kahului. The majority of the R-1 and R-2 water use is for irrigation. The Maui County Code was amended in 1996 requiring commercial properties (agricultural, commercial, public uses) within 100 feet of a Maui County R-1 water distribution system to

connect within one year of recycled water availability and to utilize recycled water for irrigation purposes.

WWRF	Treatment Level	WWRF Design Capacity (mgd)	Recycled Water Produced (Ave. mgd)	Recycled Water Used (Ave. mgd)	% of Total Produced Used	% of Design Capacity Used	Application
Wailuku-Kahului	R-2	7.9	4.7	0.25	5.3%	3.2%	None
Kihei	R-1	8	3.6	1.5	41.5%	18.7%	Golf Course, Agriculture, Dust Control, Landscape, Fire Protection
Makena (Private)	R-1	0.75	0.08	0.08	10.6%	10.6%	Golf Course
Pukalani (Private)	R-1	0.29	0.19	0.19	100%	65.5%	Landscape
Haleakalā (Private)		N/A	0.18	N/A	N/A	N/A	Closed loop system; Sanitary purposes
Lahaina	R-1	9	3.84	0.88	22.9%	9.8%	Golf Course, Landscape, Nursery, Agriculture
County Subtotal		**24.9**	**12.1**	**2.38**			
Total		**25.9**	**12.6**	**2.65**			

Source: County systems: County of Maui Environmental Management Dept., Wastewater Reclamation Division, 2014 Average. Other systems, 2013 Update of the Hawaii Water Reuse Survey and Report, State of Hawaii, 2012 data. http://files.hawaii.gov/dlnr/cwrm/planning/hwrsr2013.pdf

Stormwater Reuse

Stormwater reuse provides for capture and reuse of surface water runoff. Stormwater reclamation can potentially provide water for non-potable water demand such as irrigation and toilets. Due to contaminants picked up by stormwater runoff different levels of treatment may be necessary. Water-impounding reservoirs, which are regulated by the Department of Land and Natural Resources' Dam Safety Program, include the Waikamoi and Olinda reservoirs that supply the Upcountry system. Use of rain barrels or infiltration methods may be used by individuals or for small projects. Stormwater reclamation methods that employ capture and storage technologies must be planned, constructed, and operated to ensure minimal impact to streams, riparian environments, conservation lands, water rights, cultural practices, and community lifestyles.

Reduced reliance on groundwater and surface water for landscape irrigation may be appropriate, especially when incorporated into the design of development projects to minimize infrastructure costs.

Table 7-1: Stormwater Reclamation Technologies	
Technology	**Description**
Source Reuse	Use rain barrels or cisterns to collect precipitation or stormwater runoff at the source to provide water for a variety of non-potable purposes or, with treatment, potable water.
Small Lot Reuse	Manage precipitation or runoff as close to source as feasible. Examples: infiltration planter boxes, vegetated infiltration basins, eco roofs (vegetated roofs), porous pavements, depressed parking lot planter strips for biofiltration, narrowed street sections with parallel or pocket bioswales.
Stormwater Capture	Employ ditches, storm drainage system interception, dry wells, infiltration galleries, and injection wells to capture stormwater.
Stormwater Storage	Use aquifer storage and recovery, stream-bank storage, detention basins, and surface reservoirs to store stormwater.
Stormwater Distribution	Distribute stormwater via gravity ditch or pipe networks, operated/regulated ditch systems, pressure pipe networks, onsite wells.
Source: CH2MHill. *Hawaii Stormwater Reclamation Appraisal Report.* Prepared for the U.S. Bureau of Reclamation and the State of Hawaii Commission on Water Resource Management. July 2005	

Desalination

Desalination can remove salt and other dissolved minerals from the source water. Seawater, brackish water, or treated wastewater can be processed through several desalination methods: distillation, vacuum freezing, reverse osmosis and electrodialysis. Desalination requires significant electrical power and therefore has a high financial and potentially environmental cost. Disposal of the brine poses an environmental challenge. Injection wells or direct ocean outfall are likely options for brine disposal.

Conservation

The Hawai‘i Water Conservation Plan, 2013, defines water conservation as the reduction in fresh water use by improving the efficiency of water delivery and end uses. Conserving water and avoiding water waste are important for long-term sustainability even in times of abundant rainfall. Managing water demands and implementing viable conservation measure can delay or avoid additional capital infrastructure, decrease operating costs, and avoid environmental degradation relating to both public and private water utilities. Water conservation is a critical component of climate adaptation and can increase resilience to declining water supply or more frequent drought. The County's policy is to promote water conservation per County Code Section 14.03.010 which also states:

A. Water is a valuable natural resource that should always be used wisely and be managed as a public trust.
B. Unrestricted water use for nonessential needs may endanger the adequacy of the County's water supply for essential needs.

C. A water conservation plan is essential to preserve water resources and to reduce the risk and severity of water shortages. Such a plan will significantly reduce the long-term and short-term consumption of water, thereby preserving available water for the future requirements of the County, while minimizing the hardship caused to the general public. The enactment of a water conservation plan is further necessary in order to preserve and protect the public health, safety, and welfare.

Conservation requires a range of actions affecting a wide range or uses in order to accomplish a measurable and significant reduction over time. Potential targets to reduce water demand may include:

1. Reduce average daily water demand by ___
2. Reduce peak season water use by ____
3. Reduce water loss by ____
3. Delay the need for raw water supplies by _____
4. Delay the need for water supply by supplying __ domestic water users (accounts) with water conservation devices per year
5. Increase public education by conducting ___ outreach actions per year

Conservation programs can be implemented by water purveyors of all sizes. DWS is further developing and expanding its water conservation program, which includes both supply side and demand side measures. Anticipated program elements include:

- targeted audit and direct install programs
- rebates and incentives
- expanded conservation requirements for landscaping and other uses
- expanded marketing efforts including targeted user groups such as a hotel awards program building manager information program, and agricultural user working groups/services
- energy production and efficiency measures
- continued watershed protection and restoration
- possible major capital expenditure to support reclaimed water use

<u>Supply Side Measures</u>

1. Leak Detection

An effective leak detection program is critical to identifying unaccounted for water and proactively preventing as much water loss as feasible. Major benefits to a leak detection program include the ability to: respond more quickly to identified leaks; find “hidden” leaks creating ongoing water loss; reduce pressure, especially during low demand; and replace aging and weakened pipe.

2. Universal Metering, Meter Testing, Repair and Replacement

Metering all classes of customers and governmental entities and replacing old water meters ensures efficiency and can identify leaks or other anomalies in water usage. Preventive and predictive maintenance can help to reduce unaccounted-for water in the system by targeting old and substandard lines for replacement.

3. Valve Exercising Program

Water valves may leak and large amounts of water may be lost through these connections. An active valve exercising program on an annual cycle can mitigate water loss.

4. Water Use Auditing

Unaccounted for water includes line flushing, customer meter calibration inaccuracies (due to aging) and theft. Regular comparison of water produced and delivered aids in the identification of potential water waste situations and acts as a backup to the other programs.

Demand Side Measures

1. Public Information and Education

Public education measures can include advertising, community events, and other outreach.

2. Regulatory Requirements

Maui County has adopted the following regulations and rules that support water conservation:

- Maximum flow rate standards for plumbing fixtures sold by local distributors (County Code, Chapter 16.20)
- Prohibition of discharging cooling system water into the public wastewater system (County Code, Section 14.21A.015)
- Plumbing code regulations that require low flow fixtures in new development (County Code, Chapter 16.20B)
- Requirements that all commercial properties within 100 feet of a reclaimed water line utilize reclaimed water for irrigation and other non-potable uses (County Code, Section 20.30.020A)
- A water waste prohibition with provision for discontinuation of service where negligent or wasteful use of water exists (County Code, Section 14.03.050)
- A provision enabling the Water Director to enact special conservation measures in order to forestall water shortages (County Code, Section 14.06.020)
- Regulations for the Control of Water Usage During Droughts (County Code, Chapter 14.06)

Expanded regulatory options could address landscaping and irrigation, grey water use for commercial and residential purposes, and compliance with EPA WaterSense Program.

3. Plumbing Retrofits and Sub Metering

Distribution of low flow fixtures and retrofit/direct installation programs can be especially effective in combination with water audits and sub-metering of multi-family units and multi-purpose buildings. Studies indicate that metering un-metered units is among the most effective conservation measures, by billing explicitly for water use rather than hiding this cost in the rent.

4. Rebates and incentives

Rebates and incentives can include hotel awards program, a building manager information program, agricultural user working groups/services, as well as energy production and efficiency measures. State and local government can enhance “green-building” efforts with county rebates and utility credits and state income tax credits directed specifically at water conservation.

Resource Augmentation

Measures to protect, restore and enhance the resource include watershed management, wellhead protection, and stream restoration. Stream restoration can be an integral component of surface water use options and generally has strong community support. Shifting resource management to integrate the ahupua`a stream based mauka to makai concept is a more holistic approach to managing surface and groundwater rather than focusing on fragmented resources.

Watershed Management

Maintaining healthy forests is essential to maintaining the healthy streams and groundwater aquifers. When the forest is damaged, it loses its capacity to capture rainwater and increase condensation and rainfall. The single greatest threat to the native forest is the destruction caused by non-native, invasive animals and plants. Deforestation for agriculture and urbanization disrupts the native ecosystem resulting in an increase in erosion, siltation and impacts to the watershed, beaches and the tourist economy. Nearly two-thirds of Maui's original forests have already been lost. State and county agencies as well as private purveyors can provide financial support and participation in watershed protection partnerships and reforestation programs. An across-the-board fee for water use can impart a conservation price indicator, and fund the cost of water management and conservation.

Wellhead Protection

The County DWS initiated the Wellhead Protection Program to protect ground waters that supply, or potentially supply, drinking water to wells operated by the DWS. The Draft Wellhead Protection Ordinance proposed for adoption delineates two Wellhead Protection Overlay Zones based on the time it takes groundwater to migrate to the drinking water well. The ordinance would institute zoning controls that restrict land uses that pose a high risk of contamination within each Wellhead Protection Overlay Zone. Protection strategies and the Draft Ordinance were developed with community input at ten public meetings throughout Maui County; as of 2016 the ordinance continues to be under review. This program to protect the water sources is consistent with state and county objectives and is very viable from a sustainability and cost benefit perspective.

Appendix: Optional Strategies Matrix (Separate document)

References:

Central District Final Candidate Strategies Report, Haiku Design and Analysis for Department of Water Supply, June 2009

Upcountry District Final Candidate Strategies Report, Haiku Design and Analysis for Department of Water Supply, July 2009

South Maui R-1 Recycled Water Verification Study, Department of Environmental Management and Department of Water Supply, December 2009

Central Maui R-1 Recycled Water Verification Study, Department of Environmental Management and Department of Water Supply, December 2010

Water Resources and Climate Change Adaptation in Hawai'i: Adaptive Tools in the Current Law and Policy Framework, 2012

Maui Island Water Source Development Study, Department of Water Supply, 2013

Maui County Department of Water Supply
Maui Island Water Use & Development Plan
Public Meeting - Upcountry
March 21, 2016, 6:00 – 7:30 pm

Meeting Summary

This was the third of four public meetings and four public workshops scheduled in 2016 on the Maui Island Water Use and Development Plan by Department of Water Supply (DWS) staff. Approximately 21 people attended in addition to DWS staff.

A PowerPoint (PPT) presentation was provided by DWS staff. Written materials included the Agenda, WUDP Public Meeting Schedule, Frequently Asked Questions, and presentation slides. A 'Share your Thoughts' Questionnaire was provided.

The following questions and comments were recorded by DWS staff at the meeting. DWS responses are provided in parentheses.

Comments on the PPT slides included to indicate which data is for DWS systems only, and when demand is population based and does not include agriculture.

In the PPT, "Water Use by Resource" pie chart, what does the category "untapped" mean? (It is the total balance of the unutilized sustainable yield of each aquifer.)

PPT Reliability slide- what does seasonal mean? (It means when water is plentiful.) Doesn't it also mean in times of drought?

PPT page 18- what is the population based projection based on? (The 2014 Socio-Economic Forecast base case prepared by the Planning Department.)

The 7.5 mgd scenario for Upcountry is not planned for in the population growth based planning scenario.

PPT slide 20 says the Upcountry meter list demand is 1.75 to 7.5 mgd. What is this based on? (Per DWS experience about 50% of meters that are allowed to proceed are falling through, so a worst case scenario is about 7.5 mgd.) It is irresponsible to call 7.5 mgd "unplanned" – it should say "potential".

What does it mean when you say the Saturday workshops are going to be technical? (We are going to get into strategies, benefits, generalized costs, etc. You do not need to be a scientist or technician to participate, but they will be hands on. The DWS is soliciting public input to create a more diversely and comprehensively informed WUDP.)

For the Upcountry meter list, how many meters are within and outside the Urban Growth Boundary (UGB)? (We can do a count, but it does not affect whether the meters are issued. The DWS does not prioritize on an "inside" or "outside" basis.)

It should matter. The Community Plan for the Upcountry area provides policy on priorities based on types of users, e.g. agriculture and DHHL are prioritized.

There was nothing mentioned in your presentation about elevation which affects cost to pump to various areas. The cost to deliver to different elevations should be disclosed in the WUDP. (We will provide cost ranges, life cycle costs.)

Will the WUDP look at aging infrastructure- repair, replacement? A map for each region for capital costs and pumping should be provided to provide decision-makers with information to better plan where water and people should go. (The WUDP is resource based, not capital improvement plan (CIP) level so this will not be addressed in detail.)

Does the County have a plan for aging infrastructure? (Yes, asset replacement is addressed in ongoing CIP.)

How will water allocation policies and the WUDP support anticipated population growth Upcountry? Policy seems to drive population to the central Maui and Kihei areas. We are subsidizing expensive meters Upcountry (Land use policies in the Maui Island Plan are conflicting, we have the meter list; is subsidizing meters Upcountry something the community does not want?)

The PPT talks about Kuleana Rights and Public Trust Purposes and opportunities for ahupua'a management, which emphasize sustainability. This may not align with the "best economic and social interests" of the people. It's great to say you will look at ahupua'a management but what are some examples of how the DWS will implement Native Hawaiian water rights? (It may be other entities than DWS implementing water rights. An example could be extending active watershed management to lower elevations. With fragmented land ownership and instream flow standards being set by CWRM among other constraints, we are seeking your feedback.)

In Na Wai 'Eha, the County pays Wailuku Water Company $0.06 per thousand gallons of untreated water. Will that change? (We do not have contracts addressing future service from WWC or EMI so this is unknown.)

How does draft House Bill 2501 (holdover of revocable water rights) affect Upcountry? (The Upcountry meter list is not affected by HR 2501.)

The relationship of the meter list to the UGB should be addressed, whether the meter application was filed before or after the UGB was established. (We can provide that information. This could be an example of something that could be prioritized in the WUDP.)

Pukalani area- what consideration is given to water in ditches that wind through the area and support aesthetic values? (Since water in ditches for aesthetic purposes would probably not qualify as a public trust use, it would not be a priority.)

What are the costs and benefits of the County taking over the EMI system? What are the range of potential uses? This should be assessed and disclosed to some extent in the WUDP. (The degree to which this would be addressed in the WUDP is not determined. It may be part of an alternative. The 2004 State Agricultural Water Use and Development Plan projects a demand of 3 to 12 mgd for diversified ag over a 20-year period. Compared to the water demands of HC&S, this is miniscule. The WUDP will provide several alternative scenarios to sugar.)

For the Upcountry meter list, provide information on the proposed use (domestic, agriculture) which relates to drastically varying quantities of water. It is critical to provide information on the number or units being proposed.

The DWS Director's posture is that he is running a utility, which is immoral because it shows no regard for other community uses and values, but this is consistent with the apparent unwillingness or inability of the DWS to address many issues. There is no sense of the rights of native tenants. Everyone is waiting for the state to address public trust uses. The only vehicle is litigation. There are so many issues that DWS is not prepared to address. I don't see that this process is going to address the real issues- this is an injustice to Na Kua'aina. We should be looking at reparations. If not, look at the sustainability of all uses. The plantations have implemented adverse possession in order to take water and land away from the people. DWS needs to call HC&S to the table; if HC&S wants water, they need to participate. Is this HC&S's plan or a community plan? (This is not the DWS's WUDP; we need more public input.)

In the PPT, Water Use by Resource pie chart, how much of the agricultural demand is HC&S? (About 90 percent, or upwards of 190 mgd.) Even if HC&S uses water for diversified ag, this would reduce demand from around 200 mgd for HC&S to about 74 mgd for diversified ag which represents a significant decrease. What is the basis for the DWS assumption that HC&S will be involved in agriculture and therefore allow them to dictate future water use? This statement is important because the previous monocrop agriculture operations like Wailuku Water have attempted to stay in the water business even though they no longer grow. (Post meeting note: we used a demand of about 5,555 mgd per acre for sugar cane.)

Because the pie charts' agricultural component is comprised predominantly of sugar cultivation, if sugar will no longer be grown, the pie chart should be adjusted to reflect future anticipated needs—since the WUDP is a vehicle for future decision-making, not historical use. (The pie chart represent 2014 water use, not projected demand.)

Providing average water use in the WUDP will not help us. Summer supply and demand during stressed peak demand should be reflected in the WUDP, not yearly averages, because these figures are misleading when it really matters, i.e. times when demand is increased by 20-40%, but supply is decreased by 20-40%, which would yield a cumulative data error of 40-80%. (We agree that peak demand and studies of low flow conditions in streams are important information.)

How does total domestic household and other uses compare to agricultural use? (Agriculture is about 200 mgd vs. 45-50 mgd for total domestic and commercial use including resorts.)

In order to reflect actual demand, the meter list use should show single and multiple units per applicant—in order to show more accurate, useful data.

Will the plan be on the website? (Yes, our website information is in the handouts.)

Prepared by DWS staff, 3/21/2016