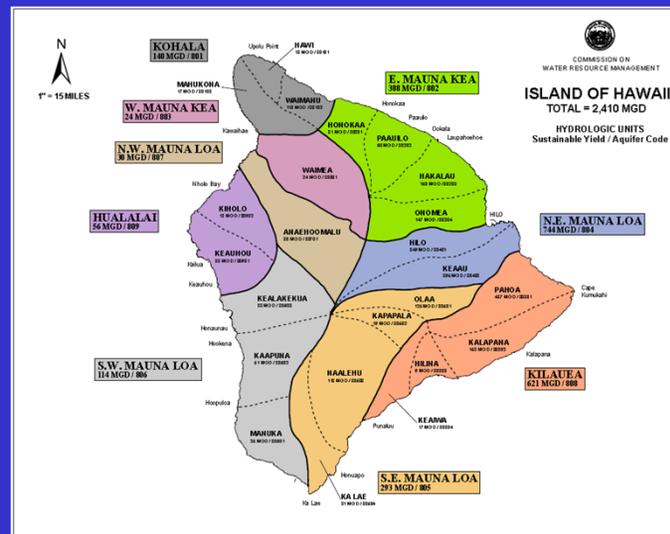
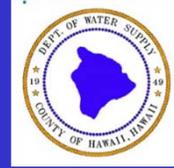
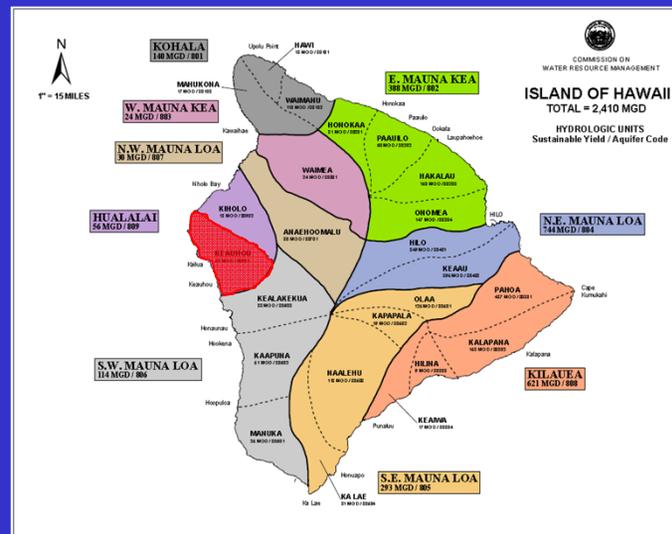


U.S. Department of Interior  
National Park Service  
Kaloko-Honokōhau National Historical Park  
Petition for  
Ground Water Management Area Designation  
Keauhou Aquifer System Area, North Kona, Hawaii

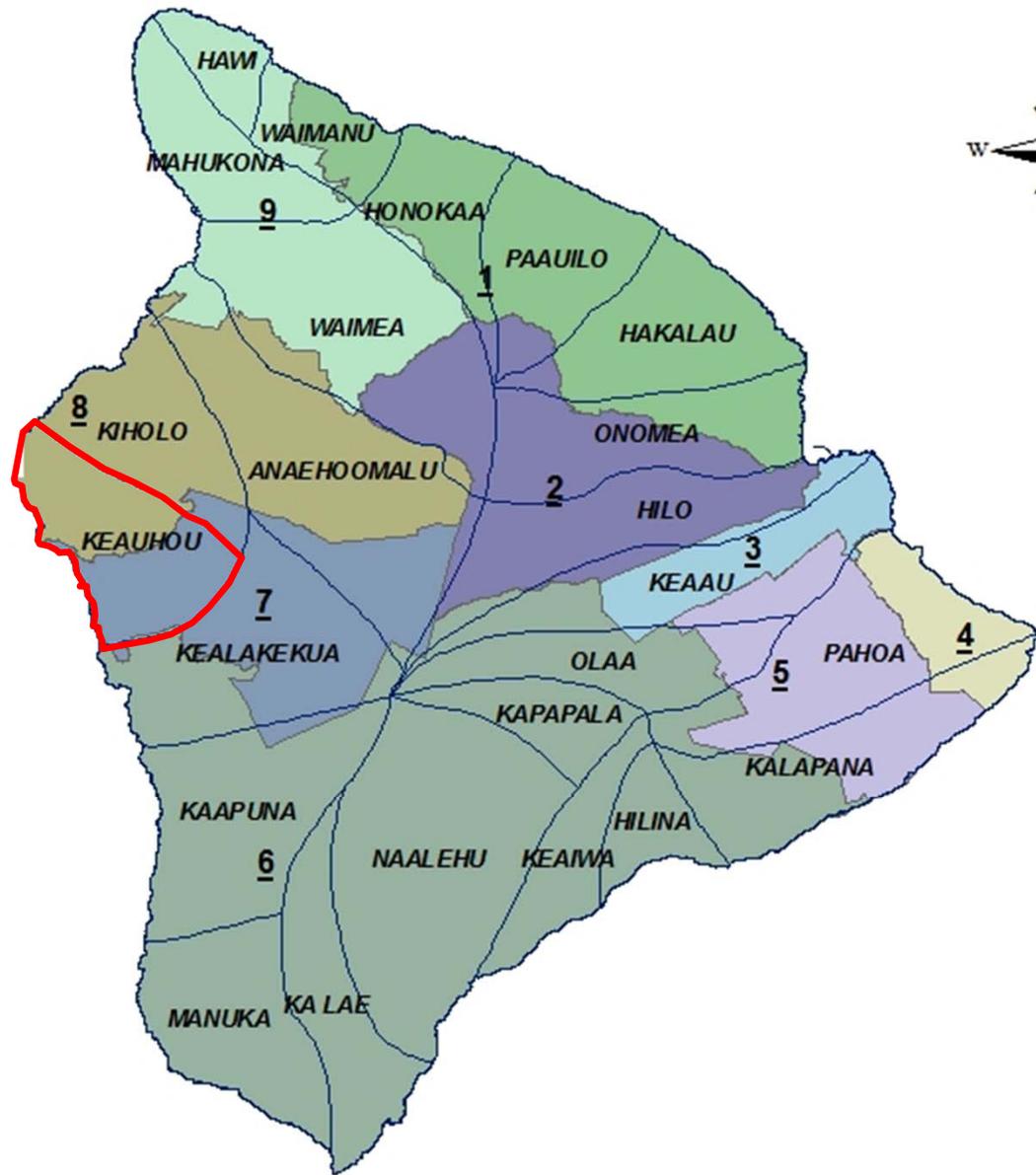




U.S. Department of Interior  
National Park Service  
Kaloko-Honokōhau National Historical Park  
Petition for  
Ground Water Management Area Designation  
Keauhou Aquifer System Area, North Kona, Hawaii



**CWRM  
Aquifer System  
Area Boundaries  
vs.  
HAWAII COUNCIL  
DISTRICTS**



# Kaloko-Honokōhau National Park

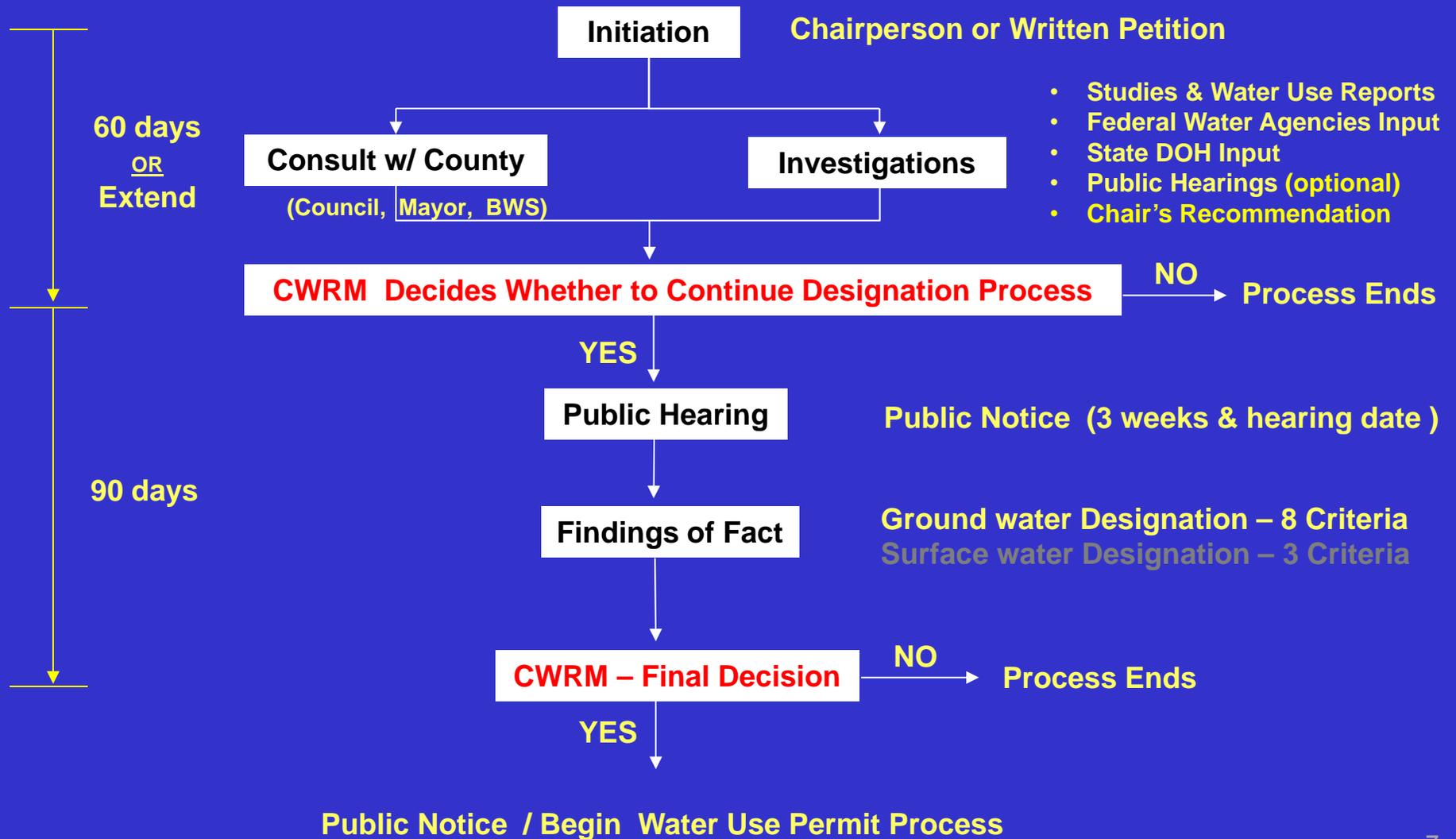


**On September 13, 2013, the National Park Service at the Kaloko-Honokōhau National Historical Park submitted a petition to the Commission requesting that the Keauhou Aquifer System Area be designated as a Ground Water Management Area.**

**Ground Water Management Areas require additional regulation through Commission-approved ground water use permits.**

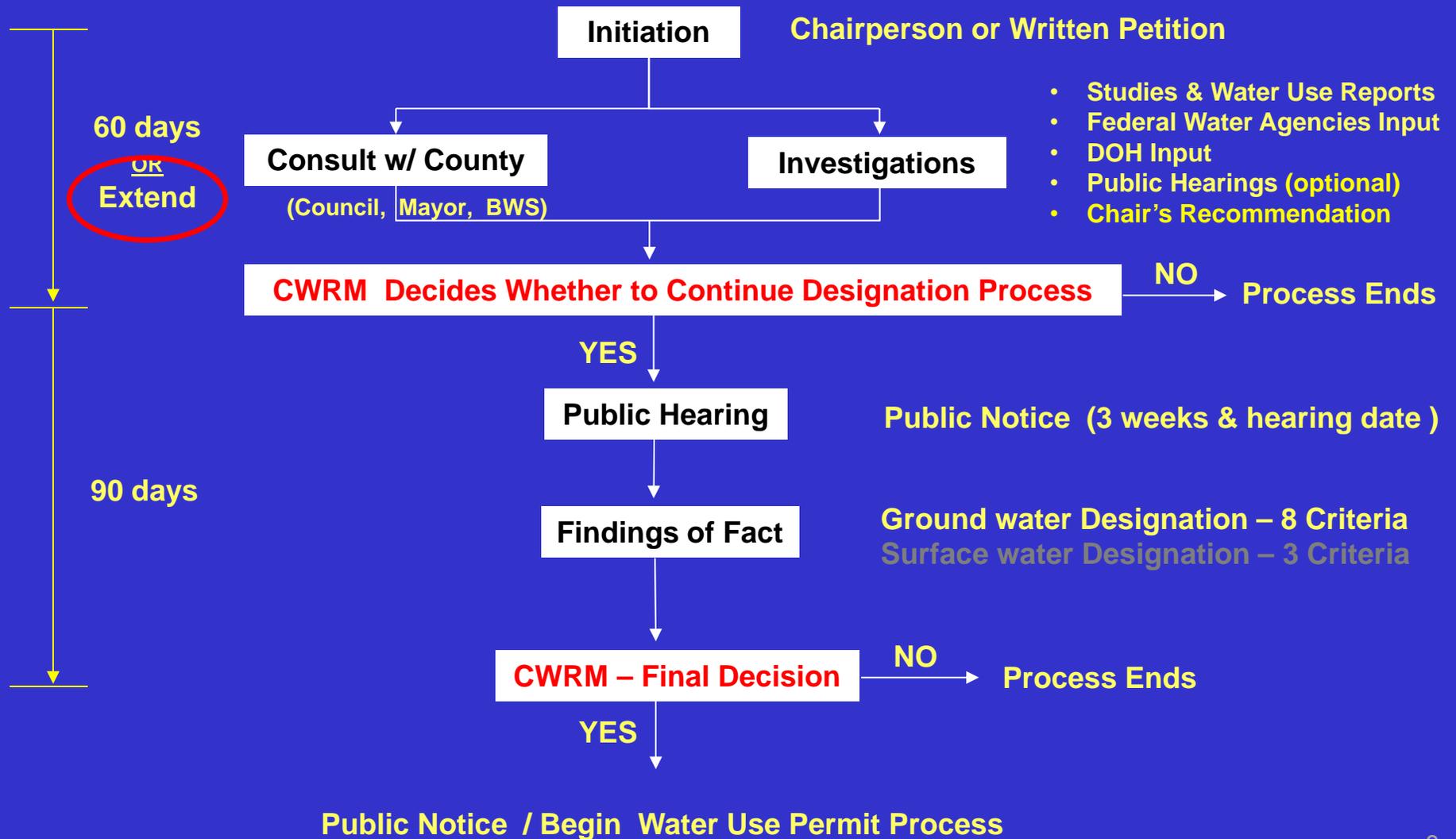
## Designation Process

(HRS 174C-41 to 46, HAR 13-171-3 to 9)



## Designation Process

(HRS 174C-41 to 46, HAR 13-171-3 to 9)



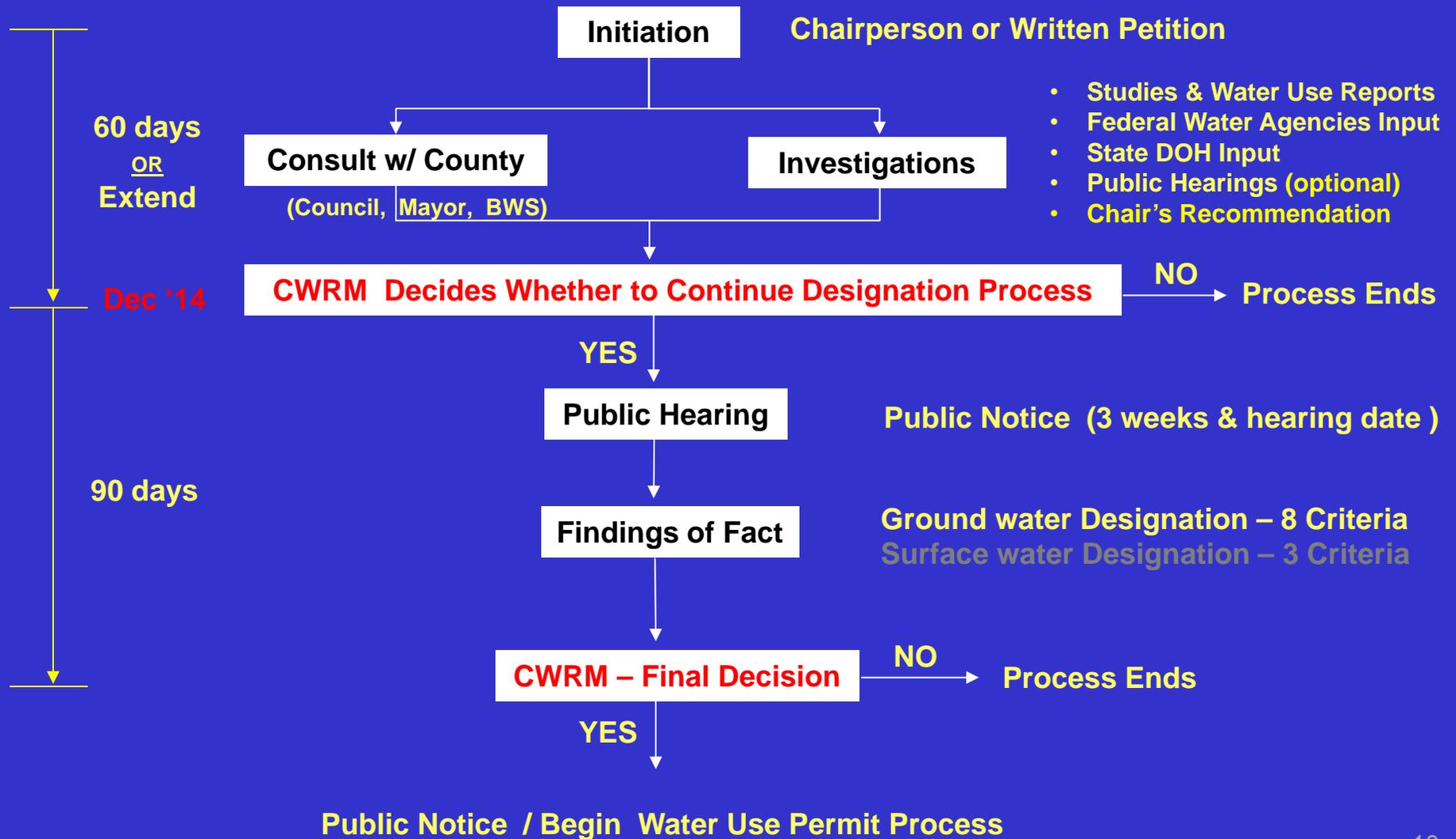


On October 16, 2013 the Commission choose to extend the review period through December 2014 to allow:

- more consultation with affected parties
- ongoing studies in area to be completed

## Designation Process

(HRS 174C-41 to 46, HAR 13-171-3 to 9)



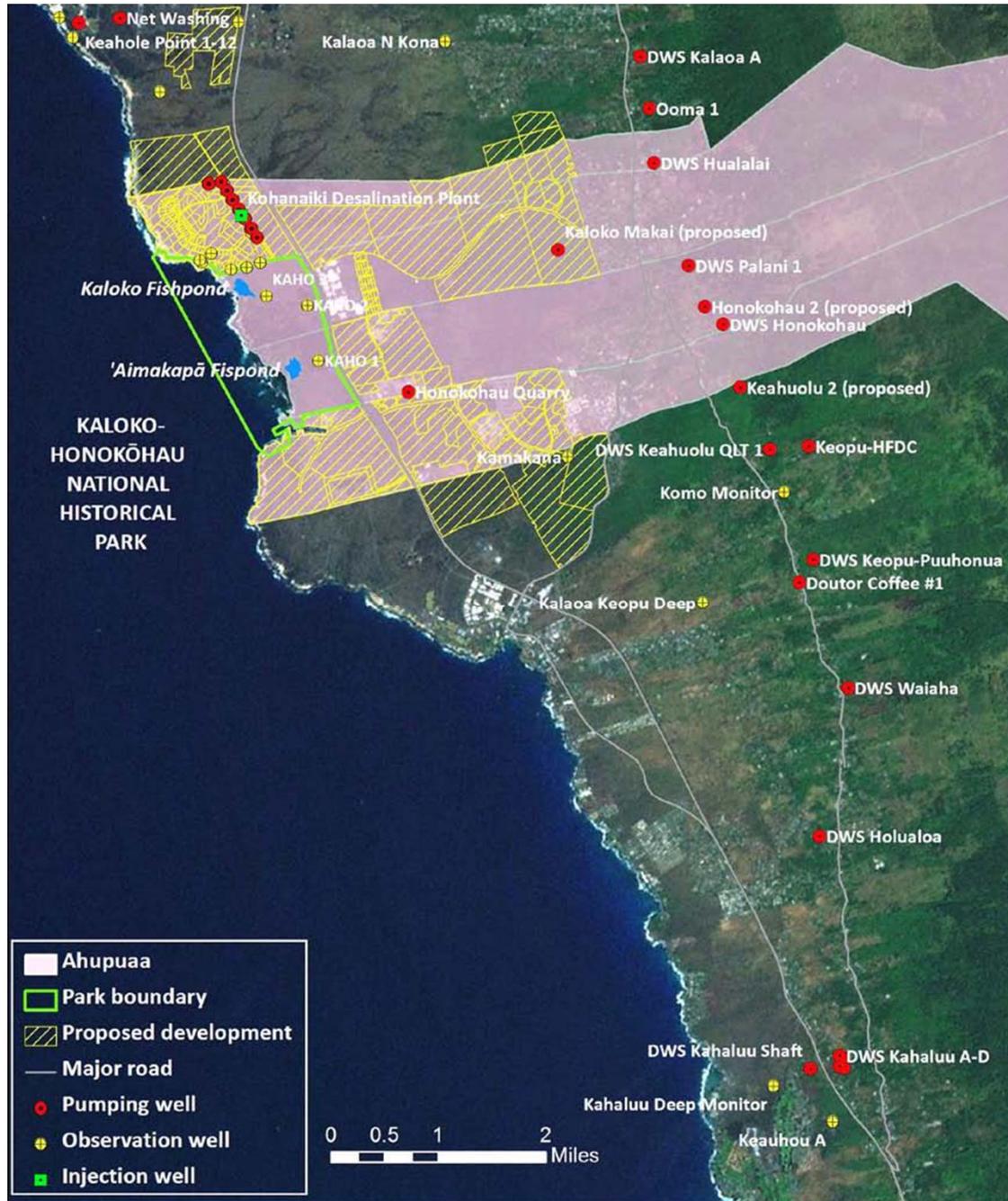
## Ground Water Criteria Commission Shall Consider (§174C-44):

- (1) Whether an increase in water use or authorized planned use may cause the maximum rate of withdrawal from the ground water source to reach 90% of the sustainable yield;
- (2) There is an actual or threatened water quality degradation as determined by DOH;
- (3) Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels;
- (4) Whether the rates, times, spatial patterns, or depths of existing withdrawals of ground water are endangering the stability or optimum development of the ground water body due to upconing or encroachment of salt water;

## Ground Water Criteria Commission Shall Consider (§174C-44):

- (5) Whether the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses;
- (6) Excessive preventable waste of ground water is occurring;
- (7) Serious disputes respecting the use of ground water; or
- (8) Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions.

# NPS Petition Details



## 2013 Petition from National Parks Service to designate the Keauhou Aquifer System Area (ASA)

5 of 8 criteria the Commission shall consider were raised:

- Sustainable Yield approach to groundwater management is not adequate to address: 1) potential harm to the biota and potential for limiting the practice of Traditional & Customary Rights caused by the reduction of shoreline discharge from pumping; 2) projected water demands that will exceed SY; 3) rising sea-level and declining rainfall; or 4) climate change.
- Documented Saltwater Encroachment: Kahaluu Area
- Waste: Kona water use is “2.5 higher than other areas of the county”
- Serious Disputes: 1) effects of cumulative future pumping on NPS resources, 2) conceptual models of the hydrogeological structure of the Keauhou ASA
- Potential development projects will contribute to cumulative withdrawals that will exceed the Keauhou Aquifer System Area sustainable yield = 38 mgd



COMMISSION ON  
WATER RESOURCE MANAGEMENT

# ISLAND OF HAWAII

TOTAL = 2,410 MGD

HYDROLOGIC UNITS  
Sustainable Yield / Aquifer Code

N  
1" = 15 MILES

**KOHALA**  
140 MGD / 801

Upolu Point  
**HAWI**  
13 MGD / 80101

**E. MAUNA KEA**  
388 MGD / 802

**MAHUKONA**  
17 MGD / 80103

**WAIMANU**  
110 MGD / 80102

Honokaa

Paauilo

**W. MAUNA KEA**  
24 MGD / 803

Kawaihae

**HONOKAA**  
31 MGD / 80201

**PAAUILU**  
80 MGD / 80202

Ookala

Laupahoehoe

**N.W. MAUNA LOA**  
30 MGD / 807

**WAMEA**  
24 MGD / 80301

**HAKALAU**  
160 MGD / 80203

Kiholo Bay

**KIHOLO**  
18 MGD / 80802

**ANAEHOOMALU**  
30 MGD / 80701

**ONOMEA**  
147 MGD / 80204

HILO

**N.E. MAUNA LOA**  
744 MGD / 804

**HUALALAI**  
56 MGD / 809

**SY = 38 mgd**

**KEAUHOU**  
38 MGD / 80801

**HILO**  
348 MGD / 80401

**KEAAU**  
386 MGD / 80402

Recharge = 152 mgd  
= 4x SY, leaving 114 mgd  
to discharge to ocean

Kailua

Keauhou

**KEALAKEKUA**  
38 MGD / 80803

**OLAA**  
126 MGD / 80601

**PAHOA**  
437 MGD / 80801

Cape Kumukahi

Honauau

Hookena

**KAAPUNA**  
61 MGD / 80802

**KAPAPALA**  
18 MGD / 80602

**KALAPANA**  
168 MGD / 80802

Kalapana

**S.W. MAUNA LOA**  
114 MGD / 806

Hoopuloa

**MANUKA**  
26 MGD / 80801

**NAALEHU**  
118 MGD / 80603

**HILINA**  
8 MGD / 80803

**KILAUEA**  
621 MGD / 808

**S.E. MAUNA LOA**  
293 MGD / 805

Punaluu

**KEAIWA**  
17 MGD / 80804

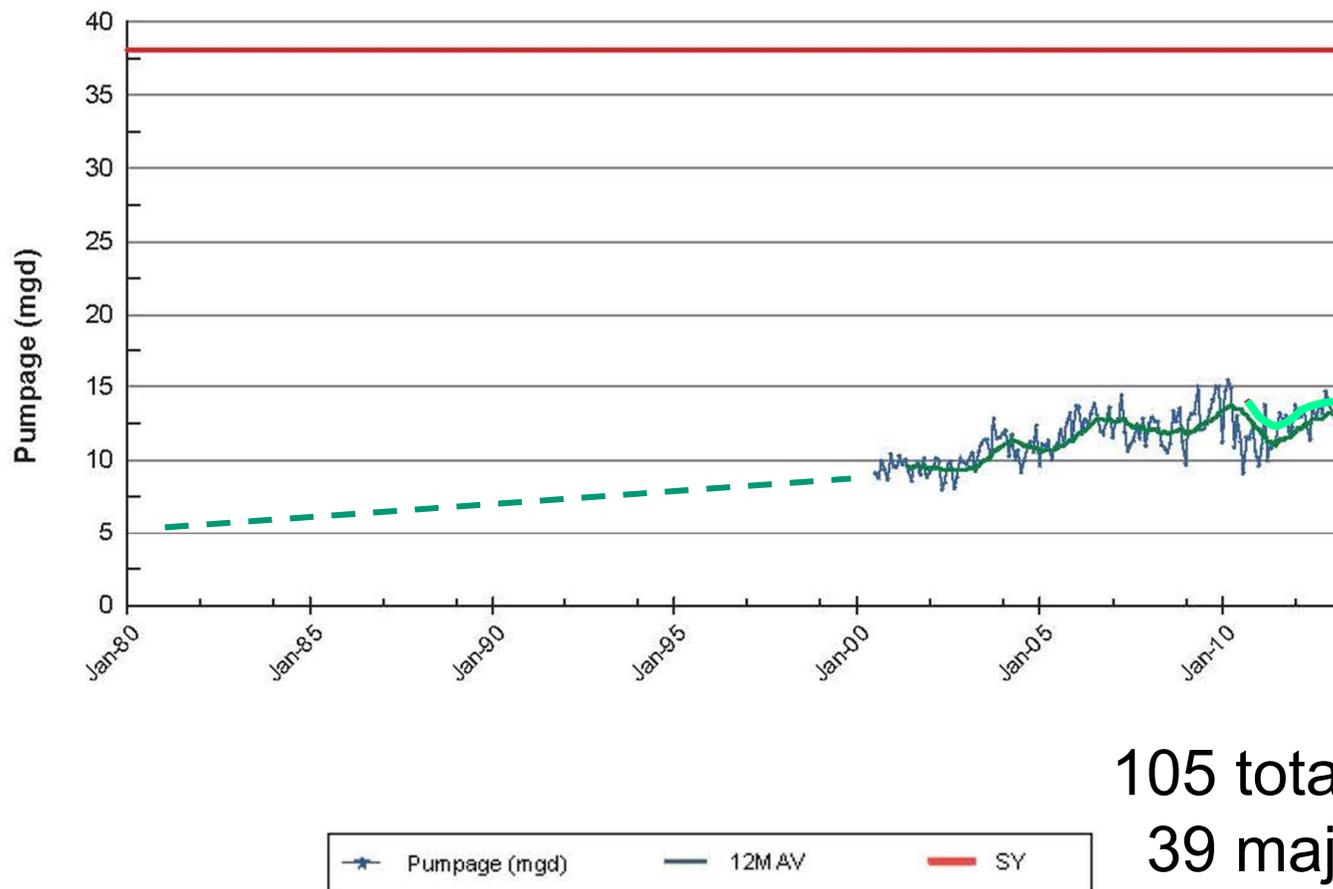
Honuapo

**KA LAE**  
31 MGD / 80604

Ka Lae



### Monthly Pumpage Chart 12 Month Moving Average



105 total wells  
39 major pumping

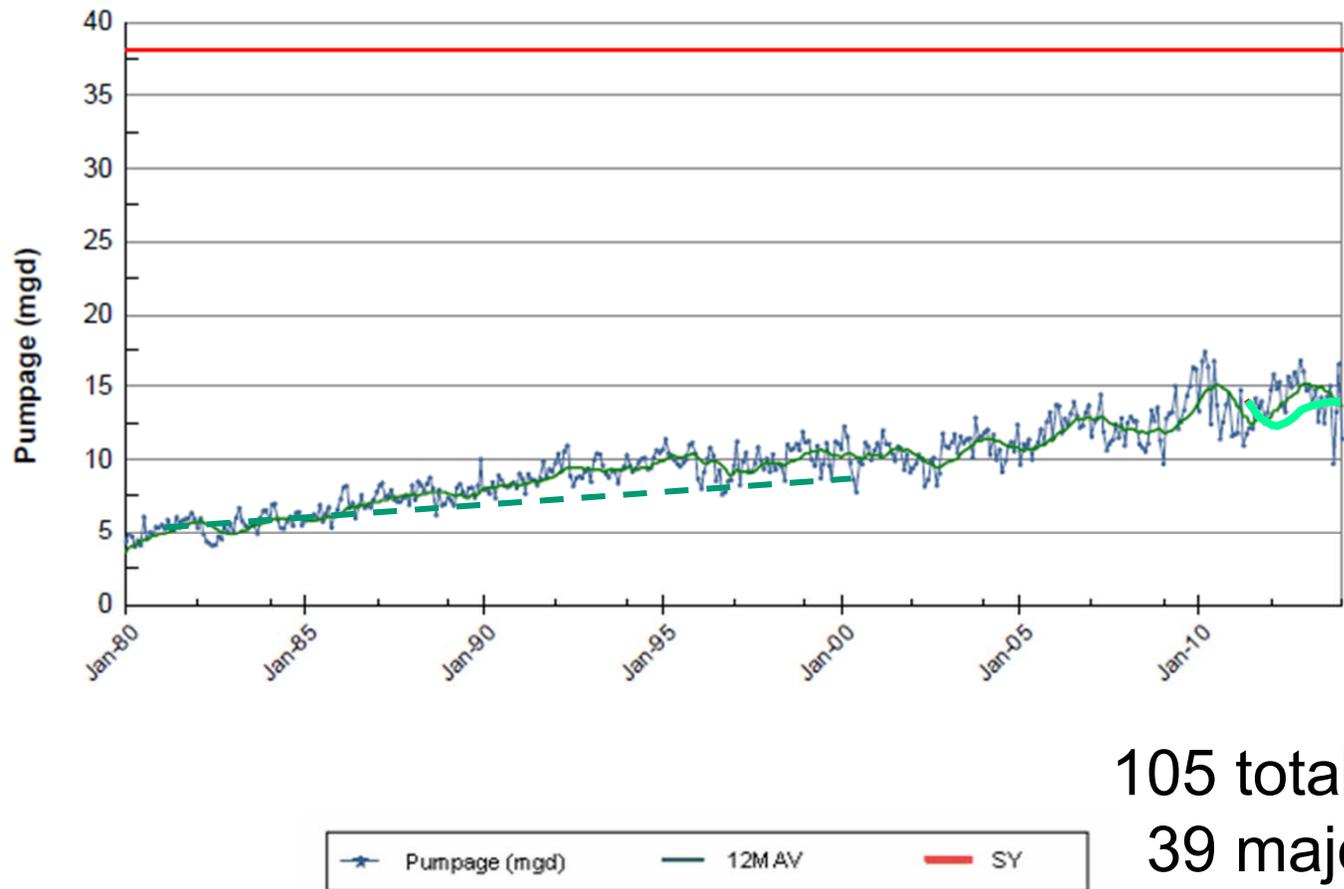
Report Parameters

Date:

1/1/1980 - 06/30/2013

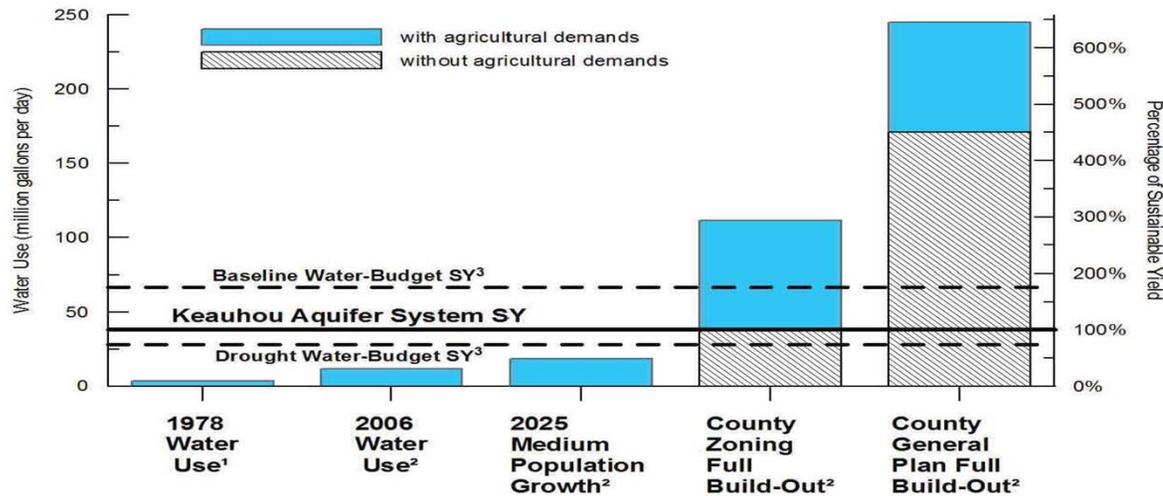


### Monthly Pumpage Chart 12 Month Moving Average



39% SY

105 total wells  
39 major pumping



**§174C-41 Designation of water management area.** (a) When it can be reasonably determined, after conducting scientific investigations and research, that the water resources in an area may be threatened by existing or proposed withdrawals or diversions of water, the commission shall designate the area for the purpose of establishing administrative control over the withdrawals and diversions of ground and surface waters in the area to ensure reasonable-beneficial use of the water resources in the public interest.

**Pumpage of 175 Mgal/d will serve > 1 million people.**

## 11-24-02 Iao/Waihee (Maui) Designation Findings of Fact

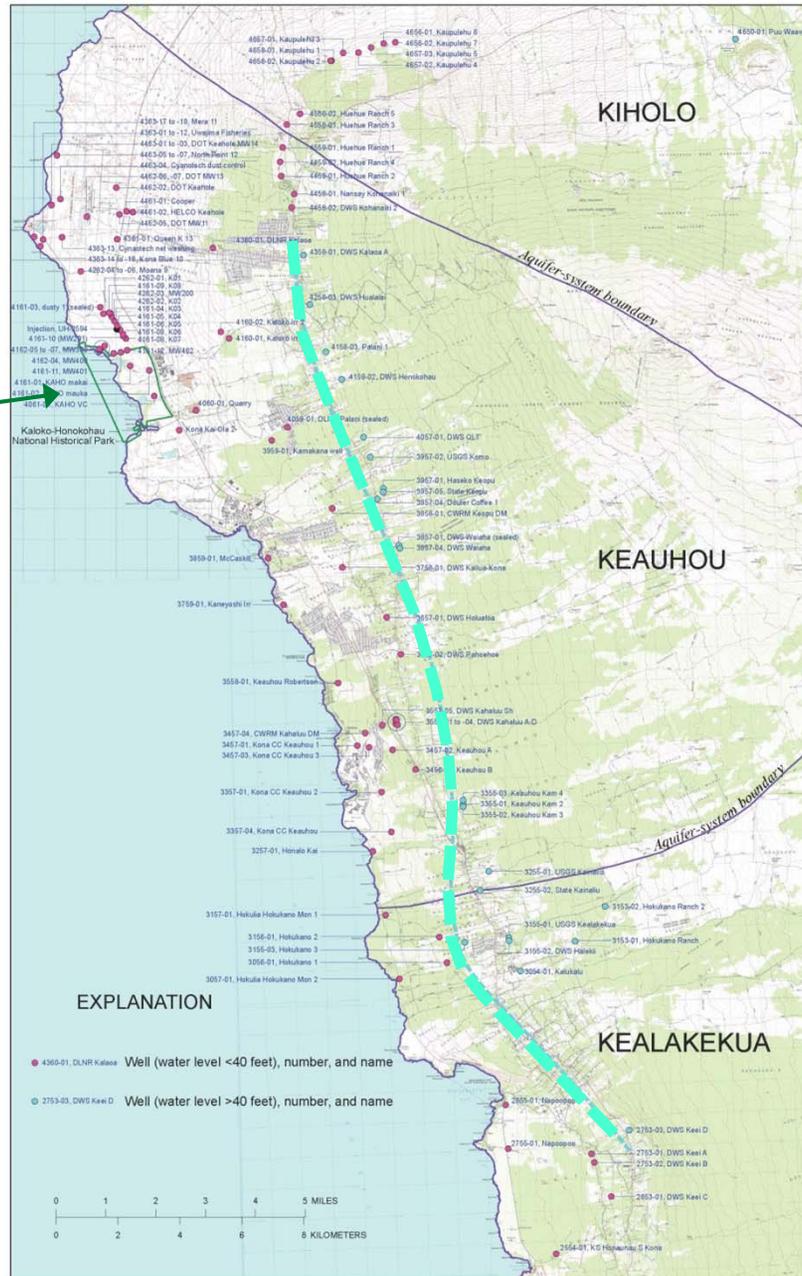
Table 11. Total projected demand

Description	1990	'96 FOF mgd	2002 mgd
Existing water commitments <sup>1</sup> (Water System Development Fee Rule)		0.410	0.411
Approved building permits w/o commitments		0.480	NA
Pending and approved building permits <sup>2</sup>		0.476	6.736
Central Maui Joint Venture (contractual obligation)		6.750 to 7	NA <sup>3</sup>
Additional demand total		8.116 to 8.366	7.147
12 –MAV pumpage for CMSA for calendar year	15.4	20.35	22.040
Total projected use	31.1 <sup>4</sup>	28.5 to 28.7	29.2

**§174C-41 Designation of water management area.** (a) When it can be reasonably determined, after conducting scientific investigations and research, that the water resources in an area may be threatened by existing or proposed withdrawals or diversions of water, the commission shall designate the area for the purpose of establishing administrative control over the withdrawals and diversions of ground and surface waters in the area to ensure reasonable-beneficial use of the water resources in the public interest.

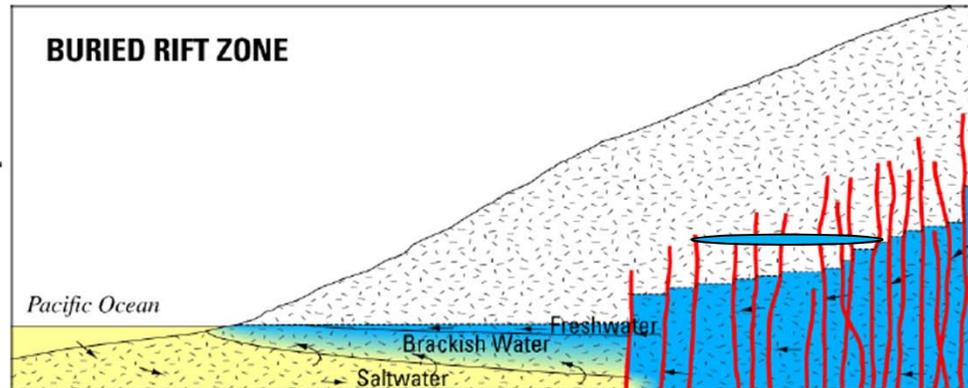
**Pumpage of 175 Mgal/d will serve > 1 million people.**

# Kaloko-Honokōhau National Park

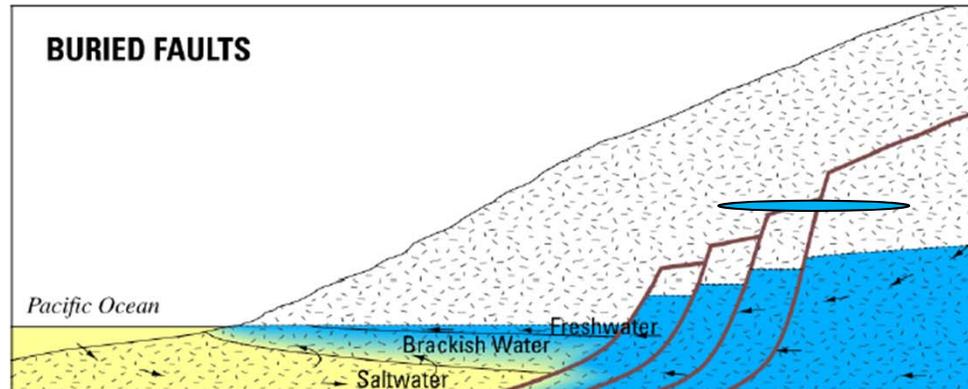


# Origin of High Water Levels

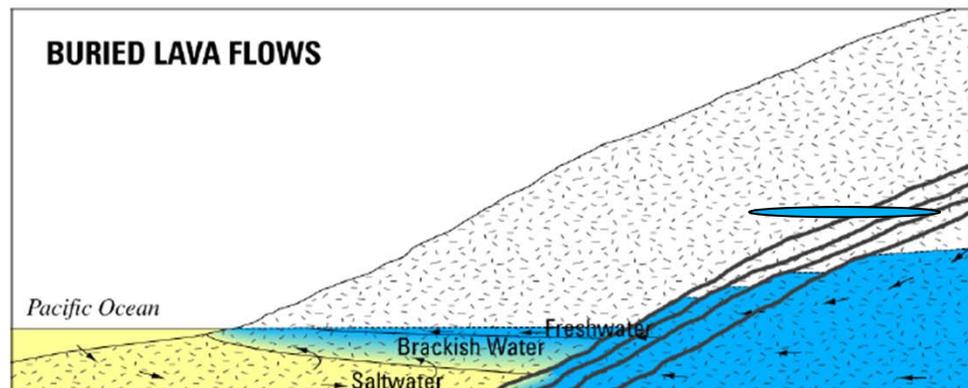
Intrusive, low-permeability dikes



Faults draped with younger lava flows

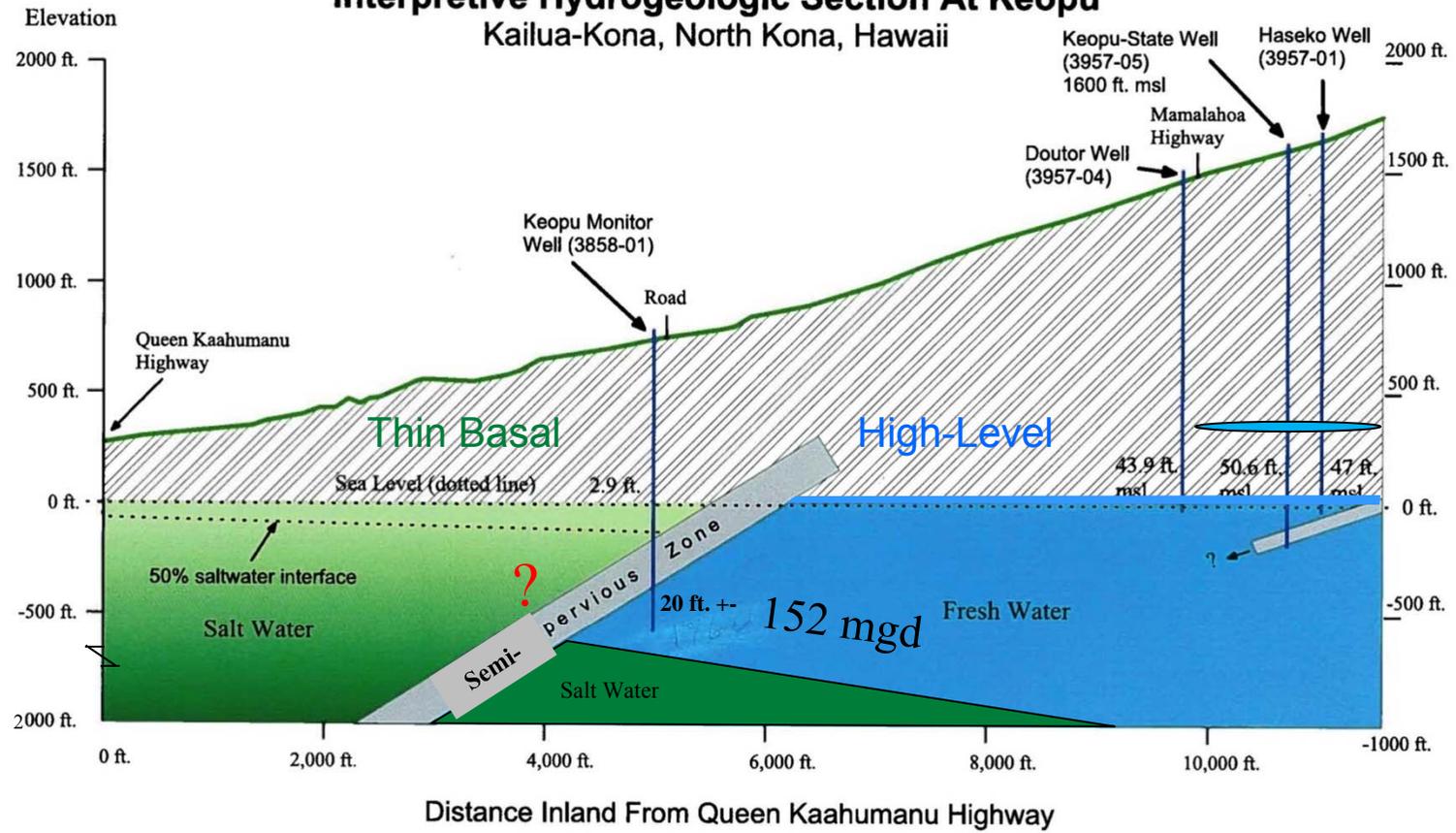


Low-permeability lava flows



(Courtesy of S. Anthony,  
2012 & NPS 2014)

**Figure 9**  
**Interpretive Hydrogeologic Section At Keopu**  
 Kailua-Kona, North Kona, Hawaii



Water Resource Associates 2006  
 067 Hydrogeologic Section

## Significant collaboration since 2007:

- **Working group** (NPS)
- **Round Table** (HDWS)
- **Professionals Group – 2008 & 2014 WRPP** (CWRM)

## Outcomes of these collaborations:

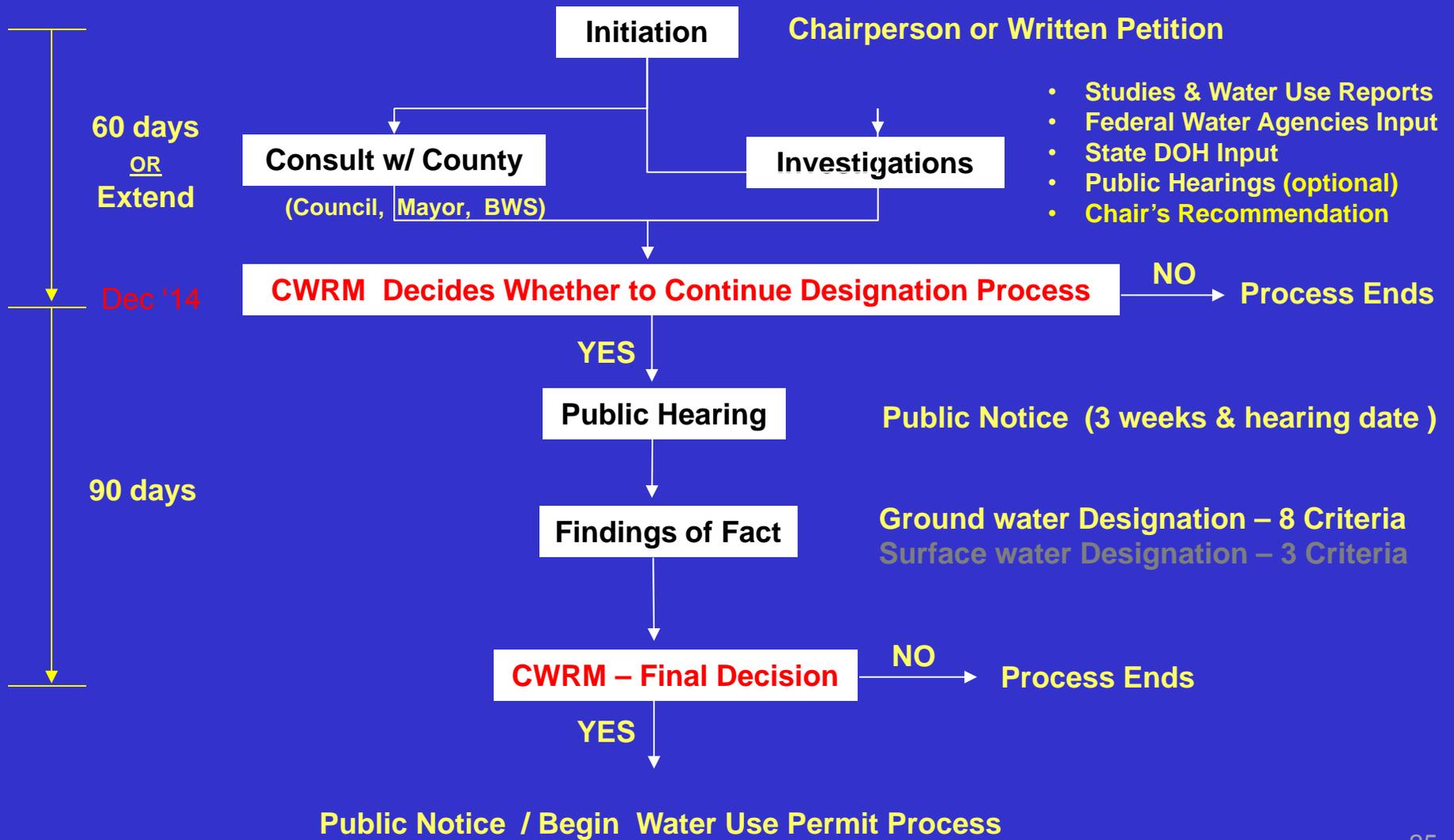
- **Increased monitoring** (increase to quarterly monitoring, 2013 online water use reporting, additional monitor wells: Komo, Kainaliu, Kamakana, Keopu, Kohanaiki, etc.)
- **Current ongoing studies** (2014 WRPP, Evapotranspiration, Recharge, & data trends updates; USGS-High-Level/Basal Isotope Study, & 3D Numerical Model)
- **Extensive bibliographies of completed studies** (2011 Big Island Recharge, 2012 Rainfall Atlas, NELHA, NPS, others)

## Staff's Preliminary Conclusions & Future Actions

- NPS case rests on potential harm to: 1) near shore biology; 2) the practice of Traditional & Customary Rights, and 3) to the aquifer from future pumpage.
- Commission needs help from the County to determine what constitutes future authorized planned ground water use for Keauhou ASA.
- Ongoing studies will better quantify the hydrology of the Keauhou ASA. These studies will be completed in late 2014.
- Increased studies and monitoring of the Keauhou ASA have improved and will continue to improve our understanding of the resource.
- September 17 & October 9 - field visits by Commission open to the public
- November - Preliminary Findings of Fact
- December 10 - Continuation Decision in Kona

## Designation Process

(HRS 174C-41 to 46, HAR 13-171-3 to 9)



## If Keauhou ASA is Designated:

- **Public Notice.** All owners of wells that use ground water have 1 year to apply for “existing” ground water use permit from published notice date.
- Existing uses at the time of designation are determined before “new” or future uses are considered.
- Public & agency review of all ground water use permit applications (GWUPA) that includes Mayor, County Council, Board of Water Supply, HDWS, registered mailing list, & Public comments.
- Individual domestic users and catchment systems are exempted from GWUPs.

## If Keauhou ASA is Designated:

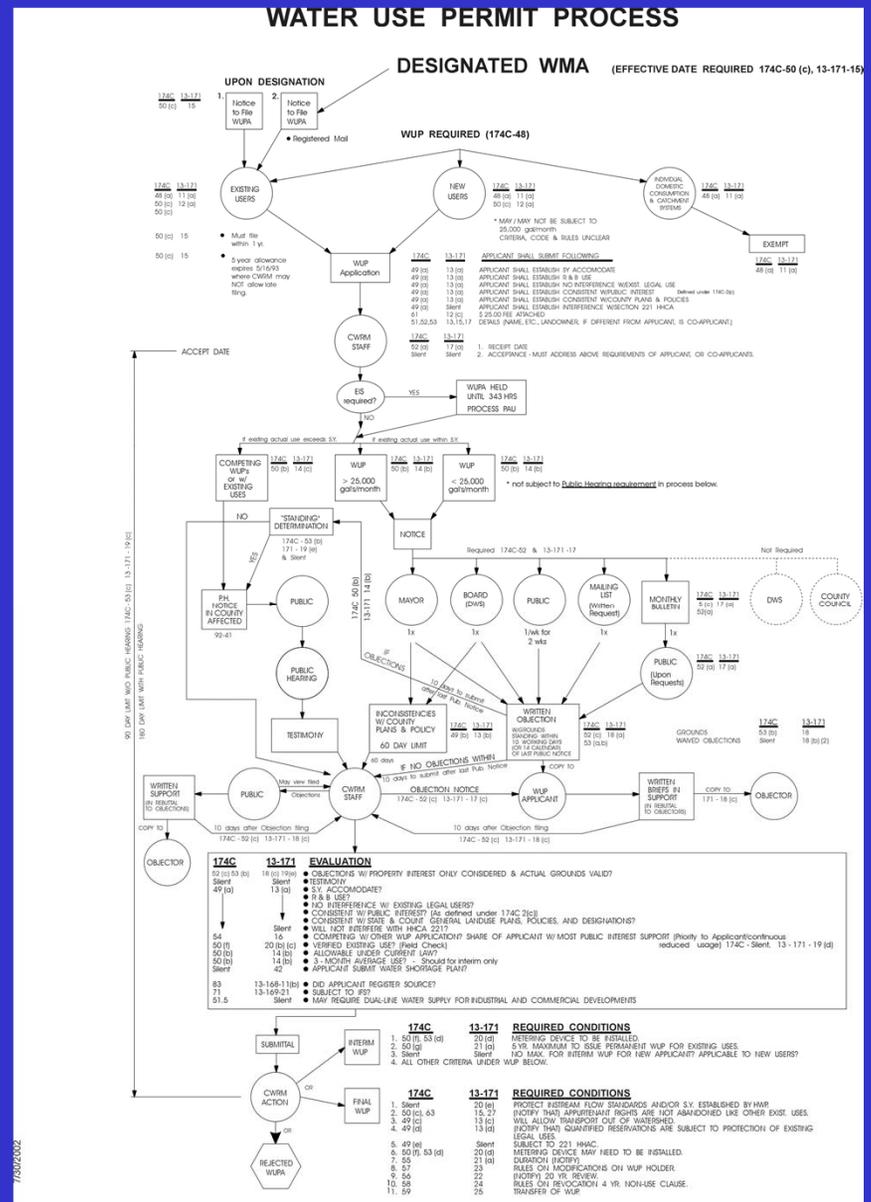
# Non-Designated vs. Designated

<b>Statewide (Non-designated Areas)</b>	<b>Designated Areas</b>
Well Construction/Pump Installation permits required (HWCPIS)	Well Construction/Pump Installation permits required (HWCPIS)
Water Use Reporting	Water Use Reporting
	Ground Water Use permits required

*(Modified from NPS & J. Scheuer2014)*

# If Keauhou ASA is Designated:

## Flow diagram of GWUPA Process



## If Keauhou ASA is Designated:

**GWUPA:** Existing Use & New Use forms. \$25 application fee (government agencies are exempted). Applications available on website: <http://www.state.hi.us/dlnr/cwrm/forms.htm>

- Well operator and well landowner must sign.
- 8 criteria applicant must address:
  - a) Can be accommodated with the available water source.
  - b) Is a reasonable-beneficial use.
  - c) Will not interfere with any existing legal use.
  - d) Is consistent with the public interest.
  - e) Is consistent with state and county general plans and land use designations.
  - f) Is consistent with county land use plans and general policies.
  - g) Will not interfere with the rights of the Department of Hawaiian Home Lands.

County



## If Keauhou ASA is Designated:

### **GWUPA (continued)**

- Timelines
  - 90-day decision deadline for action on applications with no objections
  - 180-day decision deadline for action on applications with objections (public hearings required to be held in management area. Uses <25,000 gals/month do not require public hearings even if there are objections)
  - Unknown case-by-case: All applications subject to contested case hearings if requested at the appropriate time.

## If Keauhou ASA is Designated:

### **GWUPA (continued)**

#### The Commission:

- Relies heavily on the Hawaii Water Resource Protection Plan & County Water Use and Development Plan (part of Hawaii Water Plan) for guidance
- Relies on zoning for proper land use consistency
- To establish reasonable & beneficial use:
  - Uses County Water System Standards to estimate daily demand
  - Uses an irrigation model (IWREDSS - ver 2.0) to estimate average daily demands for 5-year drought.
  - Reviews available alternative sources

- **QUESTIONS? / THOUGHTS?**

