

PATRICK K. WONG 5878  
 Corporation Counsel  
 CALEB P. ROWE 9520  
 KRISTIN K. TARNSTROM 9934  
 Deputy Corporation Counsel  
 County of Maui  
 200 South High Street  
 Wailuku, Maui, Hawaii 96793  
 Telephone No.: (808) 270-7740  
 Facsimile No.: (808) 270-7152  
 E-mail: caleb.rowe@co.maui.hi.us  
 E-mail: kristin.tarnstrom@co.maui.hi.us

Attorneys for COUNTY OF MAUI,  
 DEPARTMENT OF WATER SUPPLY

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

Surface Water Use Permit Applications,  
 Integration of Appurtenant Rights and  
 Amendments to the Interim Instream Flow  
 Standards, Na Wai Eha Surface Water  
 Management Areas of Waihee, Waiehu, Iao,  
 and Waikapu Streams, Maui

CASE NO. CCH-MA 15-01

COUNTY OF MAUI, DEPARTMENT OF  
 WATER SUPPLY'S EXHIBIT LIST;  
 CERTIFICATE OF SERVICE

**COUNTY OF MAUI, DEPARTMENT OF WATER SUPPLY'S EXHIBIT LIST**

| EX.<br>NO.    | DESCRIPTION                                                        | REFERENCES                                                     | REC'D<br>INTO<br>EVIDENCE |
|---------------|--------------------------------------------------------------------|----------------------------------------------------------------|---------------------------|
| 2178-County-1 | Form SWUPA-E and exhibits<br>submitted by DWS on March 31, 2009.   | Taylor Dec. ¶¶ 2, 7,<br>10, 26; MDWS Brief<br>pp. 1, 2, 7, 11. |                           |
| 2178-County-2 | Form SWUPA-N and attachments<br>submitted by DWS on March 31, 2009 | Taylor Dec. ¶¶ 2, 8,<br>13; MDWS Brief p. 2,                   |                           |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |  |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--|
|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8.                                          |  |
| 2178-County-3  | Letter from CWRM to MDWS Acknowledging Receipt of SWUPAs dated April 23, 2009                                                                                                                                                                                                                                                                                                                                                                                                                   | Taylor Dec. ¶ 12; MDWS Brief p. 2.          |  |
| 2178-County-4  | 2030 Maui General Plan Chapter 1: Population                                                                                                                                                                                                                                                                                                                                                                                                                                                    | McLean Dec. ¶¶ 4-6, Trial Brief Pages 3, 6. |  |
| 2178-County-5  | Agreement Concerning Withdrawal From the Iao/Waikapu Ditch Dated June 9, 2004                                                                                                                                                                                                                                                                                                                                                                                                                   | Taylor Dec. ¶ 17; MDWS Brief p. 4.          |  |
| 2178-County-6  | Amendment to Agreement Concerning Withdrawal From the Iao/Waikapu Ditch Dated November 29, 2007                                                                                                                                                                                                                                                                                                                                                                                                 | Taylor Dec. ¶ 18; MDWS Brief p. 4           |  |
| 2178-County-7  | Second Amendment to Agreement Concerning Withdrawal From the Iao/Waikapu Ditch dated February 27, 2008                                                                                                                                                                                                                                                                                                                                                                                          | Taylor Dec. ¶ 19; MDWS Brief p. 4           |  |
| 2178-County-8  | Third Amendment to Agreement Concerning Withdrawal From the Iao/Waikapu Ditch dated January 30, 2014                                                                                                                                                                                                                                                                                                                                                                                            | Taylor Dec. ¶ 21; MDWS Brief p. 4           |  |
| 2178-County-9  | Excerpts from <i>Findings of Fact, Conclusions of Law, and Decision and Order</i> filed in <u>Iao Ground Water Management Area High-Level Source Water-Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihee River and Waiehu, Iao &amp; Waikapu Streams Contested Case Hearing</u> , dated June 10, 2010.                                                                                                                                                    | Taylor Dec. ¶ 23; MDWS Brief pp. 5, 10      |  |
| 2178-County-10 | Excerpts from <i>Order Adopting (1) Hearings Officer's Recommendation on the Mediate Agreement Between the Parties; and (2) Stipulation Re Mediators Report of Join Proposed Findings of Fact, Conclusions of Law, and Decision and Order</i> filed in <u>Iao Ground Water Management Area High-Level Source Water-Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihee, Waiehu, Iao &amp; Waikapu Streams Contested Case Hearing</u> , dated April 17, 2014 | Taylor Dec. ¶ 25; MDWS Brief p. 5, 10       |  |

|                |                                                                                                                                                                                                                                                                                                         |                                                   |  |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--|
| 2178-County-11 | Expert Report of Brown and Caldwell dated December 27, 2013.                                                                                                                                                                                                                                            | Taylor Dec. ¶ 28;<br>MDWS Brief pp. 3, 6,<br>9-12 |  |
| 2178-County-12 | Excerpt from the Maui County Water Use and Development Plan, Central DWS District Plan Update dated November 16, 2010                                                                                                                                                                                   | Taylor Dec. ¶ 28;<br>MDWS Brief pp. 7, 9<br>- 11  |  |
| 2178-County-13 | Maui County Department of Water Supply Water Conservation Efforts Report                                                                                                                                                                                                                                | Taylor Dec. ¶ 27;<br>MDWS Brief p. 8.             |  |
| 2178-County-14 | Excerpts from Department of Hawaiian Homelands Regional Plan for Paukukalo and Waichu Kou, available at <a href="http://dhhl.hawaii.gov/wp-content/uploads/2011/06/Waichu-Kou-Paukukalo-Regional-Plan.pdf">http://dhhl.hawaii.gov/wp-content/uploads/2011/06/Waichu-Kou-Paukukalo-Regional-Plan.pdf</a> | Taylor Dec. ¶ 32;<br>MDWS Brief, p. 13            |  |
| 2178-County-15 | Alexander and Baldwin News Release dated January 6, 2016                                                                                                                                                                                                                                                | Taylor Dec. ¶ 33;<br>MDWS Brief p. 13.            |  |
| 2178-County-16 | Notice to Bidders for Sealed Bids for Iao Surface Water Treatment Plant Upgrades, available at <a href="http://www.co.maui.hi.us/bids.aspx?bidid=1442">http://www.co.maui.hi.us/bids.aspx?bidid=1442</a>                                                                                                | Taylor Dec. ¶ 35;<br>MDWS Brief p. 14             |  |

DATED: Wailuku, Maui, Hawaii, February 5, 2016.

PATRICK K. WONG  
Corporation Counsel  
Attorney for COUNTY OF MAUI  
DEPARTMENT OF WATER SUPPLY

By

  
CALEB P. ROWE  
KRISTIN K. TARNSTROM  
Deputies Corporation Counsel

CHARMAINE TAVARES  
Mayor



JEFFREY K. ENG  
Director  
ERIC H. YAMASHIGE, P.E., L.S.  
Deputy Director

**DEPARTMENT OF WATER SUPPLY**  
**COUNTY OF MAUI**  
200 SOUTH HIGH STREET  
WAILUKU, MAUI, HAWAII 96793-2155  
www.mauiwater.org

March 31, 2009

Honorable Laura H. Thielen, Chairperson  
Commission on Water Resource Management  
State of Hawaii Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawaii 96809

Dear Chairperson Thielen:

Subject: Application for Surface Water Use Permit for Existing Use in the Na Wai Eha Maui Surface Water Management Areas

Please find attached 15 copies of the Maui County Department of Water Supply's (DWS) "existing use" Water Use Permit Application Form SWUPA-E for 1.784 mgd from the Iao Ditch. In some instances, the format of the SWUPA-E form did not seem to be applicable to a municipal purveyor of water such as the DWS and we therefore provide supplemental and clarifying information to this form below.

**Land Use Consistency and Efficiency**

Land use consistency and efficiency of use must be described in relation to the Central Maui System as a whole, as Iao ditch along with DWS wells in Iao and Waihee aquifers are mixed so that the Iao ditch source can serve different areas within the system. In lieu of Table 2 "Land Use Consistency/Efficiency" on Form SWUPA-E, please find below water use categories, quantity in gallons per day, and number of services per water use category for existing uses with active consumption at the time of surface water management area designation. The requested amount of 1.784 mgd is DWS's highest monthly average withdrawal in the last ten years. While the current agreement with Wailuku Water Company (WWC) "Second Amendment to Agreement Concerning Withdrawal from the Iao/Waikapu Ditch" dated February 27, 2008 makes available 3.2 mgd and DWS has needs for greater withdrawals, these were limited by treatment plant capacity and the infrastructure at the time of designation. DWS has withdrawn municipal supply from Iao ditch since the 1930s. As the requested amount would serve existing uses throughout the Central Maui system, the requested amount per water use category from Iao ditch is the percentage of existing use that each water use category represents of the total water use for the Central Maui system.

*"By Water All Things Find Life"*

The Department of Water Supply is an Equal Opportunity provider and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410. Or call (202) 720-5964 (voice and TDD)

Current state land use district and County zoning codes can not be identified for all existing individual meters on the Central Maui system. However, building permits for new homes and businesses requires underlying appropriate zoning and State land use district for approval.

Table 2: Land Use Consistency/Efficiency

| Water Use Category | # Active Meters per 4/30/08 | AVG Monthly Use per 4/30/08 in 1000 gal | AVG GPD/Water Use Category | AVG GPD/Meter | Water Use/Total Use | Requested Amount GPD |
|--------------------|-----------------------------|-----------------------------------------|----------------------------|---------------|---------------------|----------------------|
| AGRICULTURE        | 19                          | 6,410.01                                | 210,164.26                 | 11,061.28     | 1.051%              | 18,754.44            |
| GOVERNMENT         | 203                         | 55,033.67                               | 1,804,382.62               | 8,888.58      | 9.026%              | 161,017.76           |
| COMMERCIAL         | 874                         | 72,327.85                               | 2,371,404.92               | 2,713.28      | 11.862%             | 211,617.15           |
| GOLF PRIVATE       | 2                           | 14.5625                                 | 477.46                     | 238.73        | 0.002%              | 42.61                |
| HOTEL              | 71                          | 57,992.66                               | 1,901,398.77               | 26,780.26     | 9.511%              | 169,675.20           |
| INDUSTRIAL         | 149                         | 24,392.97                               | 799,769.34                 | 5,367.58      | 4.001%              | 71,369.05            |
| IRRIGATION PRIVATE | 42                          | 5,815.25                                | 190,663.85                 | 4,539.62      | 0.954%              | 17,014.28            |
| MULTI FAMILY       | 512                         | 101,409.28                              | 3,324,894.34               | 6,493.93      | 16.631%             | 296,703.73           |
| MULTI FAMILY       | 9                           | 5,933.82                                | 194,551.48                 | 21,616.83     | 0.973%              | 17,361.20            |
| LOW RISE           |                             |                                         |                            |               |                     |                      |
| RELIGIOUS          | 84                          | 3,322.02                                | 108,918.77                 | 1,296.65      | 0.545%              | 9,719.59             |
| SCHOOL             | 1                           | 107.195                                 | 3,514.59                   | 3,514.59      | 0.018%              | 313.63               |
| PRIVATE            |                             |                                         |                            |               |                     |                      |
| SINGLE FAMILY      | 16,830                      | 275,727.31                              | 9,040,239.75               | 537.15        | 45.220%             | 806,724.23           |
| UNKNOWN            | 19                          | 1,260.22                                | 41,318.52                  | 2,174.66      | 0.207%              | 3,687.14             |
|                    | 18,815                      | 609,746.81                              | 19,991,698.69              |               | 100.000%            | 1,784,000.00         |

#### Irrigation Information

At this time DWS does not serve non-potable water on our Central Maui system. Some preliminary research of potential commercial projects where reclaimed water can off-set potable sources have been initiated in the Water Use and Development Plan (WUDP) process. DWS strongly encourages new developments to utilize non-potable sources where available, such as on site brackish wells. Commercial properties are required to use reclaimed water for non potable needs if located within 100 feet of a R-1 reclaimed water distribution line.

#### Alternative Analysis

We note that the various categories on CWRM's Table 4 are not specified in the State Water Code. HRS § 174C-49 sets forth the criteria that applicants must meet. Nonetheless, DWS addresses each category on Table 4 to the best of its ability. In doing so, DWS does not waive its legal objections to the imposition of these specific categories. DWS has no real, practical alternatives to the requested existing uses. DWS has considered drilling new wells in the Northern portion of the Waihee aquifer and in the Kahakuloa aquifer, but CWRM has asked

March 31, 2009  
Laura H. Thielen, Chairperson  
Commission On Water Resource Management  
Page 3

DWS to limit its withdrawals from the Waihee aquifer, and recent discussions with USGS have led DWS to conclude that new wells in these areas may not be as productive or cost-effective as previously hoped. USGS has advised DWS that the Waikapu aquifer may be a better place to seek new sources of supply and since 2006 (FY 2007) DWS has budgeted and received County Council approval for well development in the Waikapu aquifer. However, the current sustainable yield of that aquifer is 3 mgd, and DWS faces competition from private landowners for the available water in the Waikapu aquifer.

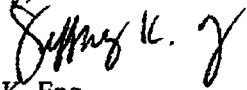
Moreover, DWS is precluded from developing more wells in East Maui in the immediate future due to the entry on December 22, 2003 of a consent decree in The Coalition to Protect East Maui Water Resources et al. v. Board of Water Supply et al., Civil No. 03-1-0008(3). In that case, the Plaintiffs demanded that before looking to East Maui as a source of groundwater, DWS look first to surface water drawn from the Waikapu, Iao, and/or Waihee hydrologic units. Therefore, DWS has vigorously pursued surface water sources as required under the Consent Decree.

CWRM's chart does not include conservation as a specific category, but DWS recognizes that conservation efforts can be a very cost effective way to stretch a limited water supply. DWS's conservation efforts include a program that provides low-flow fixtures, free of charge, and public education programs. These efforts have been successful in reducing demand by about 500,000 gallons per day. DWS has stepped up conservation efforts with additional conservation staff responsible for leak detection in water systems, commercial and industrial operations, residences, and irrigation systems; repair or arranging for repair of leaks and other problems identified; replacement of fixtures as appropriate; suggestions for plant materials as appropriate; analysis and presentation of findings; and public presentations and meetings with community groups and homeowners' associations to increase awareness of and compliance with good conservation practices.

A request for a voluntary 10 % reduction in water use from customers on the Central Maui has been remarkably successful in achieving the voluntary cutback goal of 25.5 mgd, even in the dry summer months.

We respectfully request that the Commission on Water Resource Management issue an "existing use" Surface Water Use Permit to DWS for 1.784 mgd from the Iao Ditch. We also ask that you please copy Deputy Corporation Counsel Jane Lovell with all correspondence relating to this "existing use" application.

Sincerely,

  
Jeffrey K. Eng  
Director  
emb

March 31, 2009

Laura H. Thielen, Chairperson

Commission On Water Resource Management

Page 4

c: Engineering Division

Jane Lovell, Deputy Corporation Counsel

Ed Kushi, Jr. Deputy Corporation Counsel

**attachments:**

Iao Ditch Water Use Permit Application Form SWUPA-E (15 copies) with 4 exhibits:

1. USGS Topographic map
2. Property Tax Map Key maps
3. Photographs of stream diversion and ditch intake
4. GIS maps of end use/service areas



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

APPLICATION FOR SURFACE WATER USE PERMIT  
FOR EXISTING USE IN THE NA WAI EHA, MAUI, SURFACE  
WATER MANAGEMENT AREAS

FORM SWUPA-E (NA WAI EHA, MAUI)

For detailed instructions on filling out this application, refer to the attached instructions.

For Official Use Only:

RECEIVED

09 APR 3 8:55

Event ID:

**APPLICANT INFORMATION:** Note: In accordance with §174C-51(1)(B), HRS, in the event a lessee, licensee, developer, or any other person with a terminable interest or estate in the land, which is the water source of the permitted water, applies for a water permit, the landowner shall also be stated as a joint applicant for the water permit.

|                                                                                                            |                                 |                                                                           |                          |                        |                           |
|------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------|--------------------------|------------------------|---------------------------|
| <b>1. APPLICANT'S NAME</b><br>Maui County Department of Water Supply                                       |                                 | <b>2. SOURCE LANDOWNER'S NAME</b><br>Not Applicable per HRS 174C-51(1)(B) |                          |                        |                           |
| Applicant's Contact<br>Jeffrey K. Eng, Director                                                            |                                 | Source Landowner's Contact                                                |                          |                        |                           |
| Applicant's Mailing Address, or Principal Place of Business<br>200 S. High Street<br>Wailuku, Hawaii 96793 |                                 | Source Landowner's Mailing Address, or Principal Place of Business        |                          |                        |                           |
| Applicant's Phone<br>808 270 7816                                                                          | Applicant's Fax<br>808 270 7833 | Applicant's E-mail<br>jeffrey.eng@co.maui.hi.us                           | Source Landowner's Phone | Source Landowner's Fax | Source Landowner's E-mail |

**EXISTING SOURCE INFORMATION**

The following must be attached before this application is accepted as complete:

- Portion of 7.5-Minute Series USGS topographic map (scale 1:24,000) labeled with stream and diversion locations and quad map name.
- Property Tax Map Key (TMK), showing stream or diversion location, and location of water use referenced to established property boundaries.
- Photograph(s) of the surface water diversion works and end use.

**SURFACE WATER HYDROLOGIC UNIT AND CODE:** ☐ Waialeale/6022 ☐ Waialeale/6023 ☒ Iao/6024 ☐ Waikapu/6001

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |   |        |   |      |   |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---|--------|---|------|---|--------|
| <b>4a. TMK OF STREAM DIVERSION LOCATION:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3    | - | 5      | - | 003  | : | 003    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Zone |   | Sector |   | Plot |   | Parcel |
| <b>4b. TMK OF DITCH DIVERSION LOCATION:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3    | - | 5      | - | 001  | : | 067    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Zone |   | Sector |   | Plot |   | Parcel |
| <b>5. STREAM DIVERSION:</b> How is water diverted from the stream to your property? Check all that apply.<br><input checked="" type="checkbox"/> Pipe <input type="checkbox"/> Pump <input checked="" type="checkbox"/> Ditch/auiwai <input type="checkbox"/> Other Describe: From Iao stream to Iao-Waikapu ditch. Pipe from ditch to treatment plant<br>Is the diverted water returned to the stream or ditch? <input type="checkbox"/> Yes. <input checked="" type="checkbox"/> No. If yes, how much water is returned?                                |      |   |        |   |      |   |        |
| <b>6. FLOW MEASUREMENT INFORMATION:</b><br>Does the stream diversion have a flowmeter with totalizer or other device to measure diverted amounts?<br><input checked="" type="checkbox"/> Yes. Enter the installation date: Wailuku Water Co has meter at ditch intake, unknown installation date<br>Describe the device and enter measured amounts in Table 1. DWS effluent meters at each of three treatment plan filter units<br><input type="checkbox"/> No. Explain how you are measuring flow to justify amounts shown in Table 1 in the space below |      |   |        |   |      |   |        |

**EXISTING USER INFORMATION**

|                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>7. APPURTENANT RIGHT:</b> Do you claim an appurtenant right for your water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>If yes, has the appurtenant right been established by the courts or the Commission? <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <b>8. END USER INFORMATION:</b> Are you an end user on an existing water system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>If yes, who is the operator of the water system?                                                                                               |
| <b>9. REGISTRATION AND DECLARATION OF WATER USE:</b> Do you have a Registration and Declaration of Water Use with the Commission?<br><input type="checkbox"/> Yes. List the file reference name(s):<br><input checked="" type="checkbox"/> No                                                          |
| <b>10. STREAM DIVERSION WORKS PERMIT (SDWP):</b><br>Have you ever been issued a SDWP by the Commission?<br><input type="checkbox"/> Yes. List the permit number(s):<br><input checked="" type="checkbox"/> No                                                                                          |

**NOTE:** Signing below indicates that the signatories understand and affirm that the information provided on this application is accurate and true to the best of their knowledge. Furthermore, the signatories understand that: 1) If necessary, further information may be required before the application is considered complete; 2) If a water use permit is granted by the Commission, this permit will be subject, but not limited, to any existing legal uses, changes in sustainable yields and instream flow standards, Hawaiian Home Lands uses, and any other conditions imposed by the Commission; and 3) the applicant is responsible for paying the required public notice fees associated with this application.

|                                                                                                                             |                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>11. APPLICANT</b><br><br>Signature <u>Jeffrey K. Eng</u><br>Print <u>Jeffrey K. Eng, Director</u><br>Date <u>3/31/09</u> | <b>12. SOURCE LANDOWNER</b><br><br>Signature _____<br>Print _____<br>Date _____ |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|

**SURFACE WATER USE PERMIT APPLICATION  
EXISTING USE (NA WAI EHA, MAUI)**

**TABLE 1: 12-MONTH AVERAGE DAILY USE**  
Measured or Calculated Use of Water at the Source or End Use  
As of the Effective Date of Designation, April 30, 2008

| MONTH / YEAR                                        | AVERAGE DAILY USE FOR<br>THE MONTH<br>IN GALLONS PER DAY (GPD) | Check one item per box              |                          |                          |                          | OTHER<br>Please describe |
|-----------------------------------------------------|----------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                                                     |                                                                | METERED                             | ESTIMATED                | ACTIVE BUT<br>UNKNOWN    | INACTIVE                 |                          |
| May 2007                                            | 1,263,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| June 2007                                           | 1,573,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| July 2007                                           | 1,444,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| August 2007                                         | 1,388,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| September 2007                                      | 1,370,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| October 2007                                        | 1,730,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| November 2007                                       | 1,680,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| December 2007                                       | 728,000                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| January 2008                                        | 1,121,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| February 2008                                       | 1,073,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| March 2008                                          | 1,515,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| April 2008                                          | 1,498,000                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| <b>SUM OF AVERAGE<br/>DAILY USE FOR THE MONTH</b>   | 16,383,000                                                     | GPD                                 |                          |                          |                          |                          |
| <b>AVERAGE DAILY USE<br/>(Average of the above)</b> | 1,365,250                                                      | GPD                                 |                          |                          |                          |                          |

**SURFACE WATER USE PERMIT APPLICATION  
EXISTING USE (NA WAI EHA, MAUI)**

**TABLE 2: LAND USE CONSISTENCY/EFFICIENCY**  
(Attach additional copies of Table 2 if necessary)

| LAND USE CONSISTENCY                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                        |                                  |                                                                                                        |                          | EFFICIENCY OF USE                                                                                      |                                                             |                                    |                               |                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. PURPOSE /<br>WATER USE<br>CATEGORY                                                                                                                                                                                                                                                                                                       | 2. USE TASK<br>ATTACH THE FOLLOWING:<br>• Property tax map, showing use location in reference to<br>established property boundaries<br>• Photograph of the area of use | 3. STATE<br>LAND USE<br>DISTRICT | 4. COUP<br>REQ'D<br>Enter either:<br>Yes and Date<br>approved, or<br>Yes and not<br>approved, or<br>No | 5. COUNTY<br>ZONING CODE | 6. SMAP<br>REQ'D<br>Enter either:<br>Yes and Date<br>approved, or<br>Yes and not<br>approved, or<br>No | 7. REQUESTED<br>QUANTITY OF<br>USE Gallons<br>per Day (GPD) | 8. SUB-<br>METERED?<br>(Yes or No) | 9. UNITS OR<br>NET<br>ACREAGE | 10. APPLICANT'S JUSTIFICATION FOR REQUESTED QUANTITY OF USE FOR ITEM 7.<br>If applicable, attach sheets to show how this number was calculated.<br>For irrigation uses, fill in Table 3. |
| <b>Uses that require potable (drinking) water</b>                                                                                                                                                                                                                                                                                           |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
| <b>TOTAL POTABLE USE</b>                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    | <b>GPD</b>                    |                                                                                                                                                                                          |
| <b>Uses that do not require potable water</b>                                                                                                                                                                                                                                                                                               |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                             | Zone: _____ Sector: _____ Plat: _____ Parcel: _____                                                                                                                    |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
| <b>TOTAL NON-POTABLE USE</b>                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    | <b>GPD</b>                    |                                                                                                                                                                                          |
| <b>TOTAL USE REQUESTED (Sum of Total Potable Use and Total Non-Potable Use above) =</b>                                                                                                                                                                                                                                                     |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    | <b>GPD</b>                    |                                                                                                                                                                                          |
| If total use requested is not equal to the total monthly average in Table 1, please explain.                                                                                                                                                                                                                                                |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
| In accordance with §174C-51(5), please explain if there are any limitations (legal, contractual, etc.) on the use(s) of water described above.                                                                                                                                                                                              |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |
| Per agreement entered into June 9, 2004, first amendment made November 29, 2007 and second amendment made February 27, 2008 DWS is entitled to withdraw up to 3.2G MGD except as notified by Wailuku Water Company when Iea Stream flow is below 11.5 MGD as measured at the USGS gauging station at Iea Stream at Kepaniwai Park, Wailuku. |                                                                                                                                                                        |                                  |                                                                                                        |                          |                                                                                                        |                                                             |                                    |                               |                                                                                                                                                                                          |

**SURFACE WATER USE PERMIT APPLICATION  
EXISTING USE (NA WAI EHA, MAUI)**

**TABLE 3: IRRIGATION INFORMATION**

List all crops as separate line items and include landscape and golf course irrigation, grown in the 12 months prior to April 30, 2008. Attach additional copies of Table 3 if necessary.

| 1. USE TAX MAP KEY (TMK)<br>Attach map outlining area and photo. | 2. CROP | 3. TOTAL ACREAGE | 4. NET IRRIGATED<br>ACREAGE | 5. BEGIN GROWTH<br>PERIOD (Month) | 6. END GROWTH<br>PERIOD (Month) | 7. IRRIGATION SYSTEM<br>(Refer to instructions.) | 8. IRRIGATION<br>PRACTICE<br>(Refer to instructions.) |
|------------------------------------------------------------------|---------|------------------|-----------------------------|-----------------------------------|---------------------------------|--------------------------------------------------|-------------------------------------------------------|
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |
| Zone _____ Sector _____ Plat _____ Parcel _____                  |         |                  |                             |                                   |                                 |                                                  |                                                       |

**SURFACE WATER USE PERMIT APPLICATION  
EXISTING USE (NA WAI EHA, MAUI)**

**TABLE 4: ALTERNATIVES ANALYSIS**

|                   | <b>Potable Alternatives</b><br>Attach additional sheets if necessary.                                                                                                                                                                                                                                                      | <b>Non-Potable Alternatives</b><br>Attach additional sheets if necessary.                                                                                                                                                                                                                                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Municipal sources | Existing municipal sources are used to the extent possible with consideration to system capacity, water quality, pumping permits and various operational reasons to meet current demand                                                                                                                                    |                                                                                                                                                                                                                                                                                                                            |
| Wastewater reuse  |                                                                                                                                                                                                                                                                                                                            | Expansion of the recycled water system require further quantification of end-uses and technical potential. Due to extensive capital costs and needed funding by private parties and other agencies in addition to DWS, this is a long-term goal, rather than an alternative that is available at this time.                |
| Ditch system      | DWS does not own or operate a ditch system and is using Iao/Waikapu ditch to serve current demand. DWS had preliminary discussions with Alexander & Baldwin concerning the potential for expansion of surface water treatment but ditch water availability dependson the Na Wai Eha stream water allocations.              |                                                                                                                                                                                                                                                                                                                            |
| Desalinization    | A plant for desalination of Central Maui brackish ground water for potable and non-potableneeds would have extensive energy needs and could potentially require new generation plants. Other issues are cost volatility, and disposal of brine. This strategy does not present a viable alternative to meet current demand | A plant for desalination of Central Maui brackish ground water for potable and non-potableneeds would have extensive energy needs and could potentially require new generation plants. Other issues are cost volatility, and disposal of brine. This strategy does not present a viable alternative to meet current demand |
| Ground water      | Well development in the Northern Waihee, Kahakulua, Waikapu, Haiku or Honouliuli aquifers may not be as productive or cost-effective as expected or feasible at all of this time. Any well development in either aquifer is a short to long term alternative that can not be developed in time to serve existing customers |                                                                                                                                                                                                                                                                                                                            |
| Other (specify)   | DWS conservation efforts include low-flow fixture distribution, public education, leak detection and water audits that are stepped up through additional conservation staff. Voluntary water restrictions on the Central Maui system have succeeded in achieving the voluntary curback goal of 25.5 mgd.                   |                                                                                                                                                                                                                                                                                                                            |

**PUBLIC INTEREST**

§174C-2(c) states that: *The state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision 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. Such objectives are declared to be in the public interest.*

Explain below how the uses in your application are consistent with the public interest as described above. Attach additional sheets if necessary.

DWS's existing withdrawals from Iao ditch is mixed with Iao and Waihee aquifer sources to serve the Central Maui system. This public water supply system serves 21,270 meters in the communities extending from Waiehu, through Wailuku, Kahului, Paunene, Spreckelsville, Paia and Kuau in the North, and from Msalaea through Kihei to Makena in the South. Domestic uses, such as single-family and multi-family uses, account for about two-thirds of the Central Maui system services. The remaining one-third serves commercial, industrial, and agricultural uses. A portion of these uses serve non-potable uses and is supplemented by reclaimed and brackish water for irrigation. We understand that domestic uses are protected public trust uses, and are entitled to high priority under the public trust doctrine. CWRM concluded on February 15, 2006 and January 31, 2007 that DWS's basal source withdrawals serve the public interest. The Iao ditch withdrawals serve the public interest in the same way. DWS provides for the protection and preservation of ground and surface water resources through conservation and resource protection programs.

# **SURFACE WATER USE PERMIT APPLICATION EXISTING USE (NA WAI EHA, MAUI)**

## **INSTRUCTIONS FOR FILLING OUT FORM SWUPA-E**

This application form is to be used for actual existing uses as of the effective date of designation, April 30, 2008, for the Na Wai Eha Surface Water Management Areas. Based on the State Water Code, Section 174C, Part IV Regulation of Water Use, a completed application must be filed with the Commission on Water Resource Management (CWRM) no later than April 30, 2009, to qualify as an existing use. Failure to meet the filing deadline may cause your application to be considered a new use and require you to file an Application for Surface Water Use Permit for New Use.

If you are applying for a new surface water use, which are proposed uses after the date of designation, please use the Application for Surface Water Use Permit for New Use, Form SWUPA-N.

Information about surface water management areas and the current application forms are available at our website: <http://www.hawaii.gov/dlnr/cwrm/>; by contacting the Stream Protection and Management Branch at 587-0234; or sending an email to: [dlnr.cwrm@hawaii.gov](mailto:dlnr.cwrm@hawaii.gov)

**REQUIREMENTS FOR A COMPLETE APPLICATION** Information must be legible. Therefore, please type or clearly print all information in ink.

- Fill in the most recent application form.
- Fill in every line on the application.
- Enclose a check for the non-refundable filing fee of \$25 payable to: Department of Land and Natural Resources.
- Pay for the cost of publishing any required public notices related to your application.
- Mark the source and end use locations on the appropriate USGS quad map and TMK map and attach to your application.
- Attach photos showing your existing diversion, measuring device (if applicable) and end use areas.
- Sign the application form. Both the applicant and the landowner of the source must sign the application form.
- Submit one original and 15 copies of the application form; one original and 15 copies of the attachments (instructions, maps, photos and any additional attachments) and filing fee to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809.

The applicant must establish that the existing use of water is a reasonable and beneficial use. According to §174C-3 of the State Water Code: *"Reasonable-beneficial use" means the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest.*

Furthermore, public interest is described in §174C-2(c) of the State Water Code which states that: *(t)he state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision 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 reservation and enhancement of waters of the State for municipal uses, public recreation, public water supply, agriculture, and navigation. Such objectives are declared to be in the public interest.*

### **LINE BY LINE INSTRUCTIONS FOR COMPLETING THE APPLICATION FORM**

#### **APPLICANT INFORMATION**

- APPLICANT'S NAME:** Fill in the information for the applicant. This should be the entity that will be responsible for all conditions of the water use permit.
- SOURCE LANDOWNER'S NAME:** Fill in the information for the landowner of the property where the existing surface water diversion works is located. *Note:* in accordance with §174C-51(1)(B), in the event a lessee, licensee, developer, or any other person with a terminable interest or estate in the land, which is the water source of the permitted water, applies for a water permit, the landowner shall also be stated as a joint applicant for the water permit.

#### **EXISTING SOURCE INFORMATION**

- SURFACE WATER HYDROLOGIC UNIT AND CODE:** Check the appropriate box for the hydrologic unit name and hydrologic code where the source is located. The "source" is the stream, ditch, or conduit from which water is diverted to the user. For information on hydrologic unit names and unit codes please refer to the *Surface-Water Hydrologic Unit: A Management Tool for Instream Flow Standards* report available on the CWRM website at: <http://www.hawaii.gov/dlnr/cwrm/>, or contact CWRM staff at (808) 587-0234. You may also contact CWRM toll-free from Maui at: 984-2400, ext. 70234.
- TMK OF STREAM DIVERSION LOCATION:** Fill in the current Tax Map Key (TMK) number of the parcel where the stream diversion is located if applicable. To find out your TMK number, call Maui County Real Property Tax Division at: (808) 270-7297, or check online at: [www.mauipropertytax.com/](http://www.mauipropertytax.com/)
- TMK OF DITCH DIVERSION LOCATION:** Fill in the current Tax Map Key (TMK) number of the parcel where the ditch diversion is located, if applicable.
- STREAM DIVERSION:** How is water diverted from the stream to your property? Check the appropriate box(es). Is the diverted water returned to the stream or ditch? Check "Yes" or "No." If yes, enter the amount of water returned.
- FLOW MEASUREMENT INFORMATION:** Check "Yes" or "No." If you have a working flowmeter with a totalizer, answer "Yes" to this question, and fill in the date that the flowmeter was installed and any other information you may have (manufacturer, serial number, etc.). A totalizer directly measures the total use for the source (similar to a car's odometer). Otherwise, answer "No" and explain how stream diversion is measured or estimated to justify amounts requested in Table 1.

#### **EXISTING USER INFORMATION**

- APPURTENANT RIGHT:** An appurtenant water right is a legally recognized right to a specific amount of surface freshwater – usually from a stream – on the specific property that has that right. This right traces back to the first time the land was converted to fee simple title; i.e., the Great Mahele and the issuance of either a Land Commission Award or Royal Patent. The quantity of water under the appurtenant right is the amount that was being used on the land shortly before or at the time of the Mahele. Do you claim an appurtenant right for your water use? Check "Yes" or "No." If yes, has your appurtenant right been established by the courts or the Commission? Check "Yes" or "No."
- END USER INFORMATION:** Are you an end user on an existing water system? Check "Yes" or "No". If yes, please list the name of the water system operator.
- REGISTRATION AND DECLARATION OF WATER USE:** Do you have a Registration and Declaration of Water Use from the Commission? Check "Yes" or "No". If yes, please list the name of the registrant(s).
- STREAM DIVERSION WORKS PERMIT (SDWP):** Have you ever been issued a SDWP by the Commission? If yes, please list the permit number(s). Otherwise, check "No."
- APPLICANT:** Please sign and print your name, and date your application.
- LANDOWNER:** Please sign and print your name, and date your application. The landowner shall be the joint applicant in the event the applicant is a lessee, licensee, developer, or any other person with a terminable interest or estate in the land which is the water source of the permitted water. §174C-51(1)(B)

# SURFACE WATER USE PERMIT APPLICATION EXISTING USE (NA WAI EHA, MAUI)

**TABLE 1: 12-MONTH AVERAGE DAILY USE** - Measured or calculated use of water at the source or end use as of the effective date of designation, April 30, 2008.

Please fill out Table 1 to calculate your existing use as of the effective date of the designation, April 30, 2008, of the Na Wai Eha Surface Water Management Areas. The effective date of designation is the date of the publication of the public notice of the Commission designation action. The qualifying dates have been filled in for this application. Fill in as completely as possible.

The 12-month average is the average daily use<sup>a</sup> of 12 months of consecutive use<sup>b</sup> from the last month<sup>c</sup> of the period.

- Average daily use.** This is the average daily use for one month in gallons per day (GPD). To calculate this average, take the total use (in gallons) for the month, and divide this amount by the number of days in the month.
- 12 months of consecutive use.** To calculate the average monthly withdrawal for 12 consecutive months of use, add the average daily use for all 12 months and divide that amount by 12.
- Last month.** The last month of the period is the effective date of designation, April 30, 2008.

Check only one of the following boxes per row in Table 1.

- Metered – data is based on an operational meter with a totalizer.
- Estimated – data is based on some indirect measurement technique (e.g. measured flow rate multiplied by time of operation).
- Active but unknown – source is active, but there is no means to measure or estimate flow coming from source.
- Inactive – source was not pumped or diverted for the month.
- Other – describe how water use was measured or calculated in this box.

**TABLE 2: LAND USE CONSISTENCY/EFFICIENCY**

- PURPOSE / WATER USE CATEGORY:** Choose one of the following purpose or category codes listed below for each row in Table 2. There may be several purpose/categories on a single TMK, and each purpose or category must be listed in a separate row. Attach additional copies if necessary.

|                    |                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------|
| <b>AGRICULTURE</b> |                                                                                         |
| AGRAQ              | Aquatic Plants & Animals                                                                |
| AGPCP              | Crops & Processing                                                                      |
| AGRLI              | Livestock & Processing, and Pasture                                                     |
| AGRON              | Ornamental & Nursery Plants                                                             |
| AGROTH             | Other                                                                                   |
| <b>DOMESTIC</b>    |                                                                                         |
| DOM                | Single & Multi Low-Rise & High-Rise Household                                           |
| DOMN               | Domestic (Non-residential)                                                              |
| DOMNCB             | Commercial Businesses                                                                   |
| DOMNRI             | Religious Institutions                                                                  |
| DOMNHOS            | Hospitals                                                                               |
| DOMNHOT            | Hotels                                                                                  |
| DOMNOB             | Office buildings                                                                        |
| DOMNOTH            | Domestic Non-Residential – Other                                                        |
| DOMNSC             | Schools                                                                                 |
| <b>INDUSTRIAL</b>  |                                                                                         |
| INOEL              | Geothermal, Thermoelectric Cooling, Power Development                                   |
| INDFP              | Fire Protection                                                                         |
| INDMI              | Mining, Dust Control                                                                    |
| INDOTH             | Industrial – Other                                                                      |
| <b>IRRIGATION</b>  |                                                                                         |
| IRAGC              | Golf Course                                                                             |
| IRAHM              | Habitat Maintenance                                                                     |
| IRAHOT             | Hotel                                                                                   |
| IRALA              | Landscape/Water Features                                                                |
| IROTH              | Other                                                                                   |
| IRAPA              | Parks                                                                                   |
| IRASC              | Schools                                                                                 |
| <b>MILITARY</b>    |                                                                                         |
| MIL                | Military                                                                                |
| <b>MUNICIPAL</b>   |                                                                                         |
| MUNCO              | County                                                                                  |
| MUNPR              | Privately owned and operated but defined as a public system by the Department of Health |
| MUNST              | State                                                                                   |

- USE TMK:** The Tax Map Key number of the parcel over which the water is applied. There should only be one parcel for each line. Also, attach a TMK map(s) for the lots showing the boundaries of irrigated acreage, etc., as well as a photograph of the area of use.
- STATE LAND USE DISTRICT:** To find out the current Land Use District, contact the Land Use Commission at 587-3822.
- CDUP REQUIRED:** If a Conservation District Use Permit (CDUP) is required, enter either: "Yes" and the date the CDUP was approved if you have a CDUP applicable to this project; or "Yes" and "not acquired" in this box. If a CDUP is not required, enter "N" for no in this box. To check if your parcel is in the Conservation District, contact the Land Use Commission at 587-3822. If your parcel is in a Conservation District, contact the Department of Land and Natural Resources Office of Conservation and Coastal Lands at 587-0328 to find out if a CDUP is required.
- COUNTY ZONING CODE:** To find out the Zoning Code for your property, call Maui County Planning Department at 270-6279, or 270-7253.
- SMAP REQUIRED:** If a Special Management Area Permit (SMAP) is required for this project, enter either: "Y" and the date SMAP was approved; or "Y" and "not acquired" in this box. If a SMAP is not required, enter "N" for no in this box. To find out if your property is in a Special Management Area and requires an SMAP, call Maui County Planning Department at 270-8205.
- QUANTITY OF USE:** Enter the quantity of use in gallons per day (GPD). Justification for the quantities requested may depend on your answers to items 8 and 9, and you should describe the justification in item 10.
- SUBMETERED? (Y/N):** If the specific use is submetered, enter "Y" for yes here. If it is not submetered, enter "N" for no. Submetering is specific to each line item.
- UNITS OR ACREAGE:** This is the value and category as the basis for calculating the duty. "Duty" is the amount of water used or requested for a "unit" over a specific time period, e.g. gallons per acre per day, or gallons/acre/day. "Unit" can mean dwelling units, or number of people, or animals. Examples to fill in for this category are: 400 dwelling units, 500 people, 3.74 acres.
- APPLICANT'S JUSTIFICATION FOR REQUESTED QUANTITY OF USE FOR ITEM 7:** Explain how you are justifying the amount you are requesting. Attach additional sheets if necessary.

**SURFACE WATER USE PERMIT APPLICATION  
EXISTING USE (NA WAI EHA, MAUI)**

**TABLE 3: IRRIGATION INFORMATION**

If you have grown crops in the year prior to the date of designation, please list all the crops (including landscape and golf course irrigation) that you have grown. Enter a single crop and single TMK per line. If you have multiple crops, list them all as separate line items. Attach additional copies of Table 3 if necessary.

1. **USE TAX MAP KEY (TMK):** Enter the parcel number where the crop is being grown. Attach a map outlining irrigated area(s) and photos.
2. **CROP:** Enter the crop type.
3. **TOTAL ACREAGE:** Enter the total acreage of the parcel listed.
4. **NET IRRIGATED ACREAGE:** Enter the acreage for the specific crop grown.
5. **BEGIN GROWTH PERIOD (MONTH):** This is the month of the start of the growth cycle. For perennial crops, list the 12<sup>th</sup> month prior to the date of designation.
6. **END GROWTH PERIOD (MONTH):** This is the month of the end of the growth cycle. For perennial crops, list the month of the date of designation.
7. **IRRIGATION SYSTEM:** Enter one of the following:
  - TRICKLE, DRIP
  - TRICKLE, SPRAY
  - MULTIPLE SPRINKLERS
  - SPRINKLER, CONTAINER NURSERY
  - SPRINKLER, LARGE GUNS
  - SEEPAGE, SUBIRRIGATION
  - CROWN FLOOD
  - FLOOD (TARO)
  - OTHER - Please describe.
8. **IRRIGATION PRACTICE:** Enter one of the following:
  - IRRIGATE TO FIELD CAPACITY
  - APPLY A FIXED DEPTH PER IRRIGATION
  - DEFICIT IRRIGATION
  - OTHER - Please describe.

**TABLE 4: ALTERNATIVES ANALYSIS**

Please address every alternative listed in Table 4 and whether or not they are available, for both potable and non-potable needs. Other alternatives on the last line may include stormwater reclamation, rainwater catchment, etc.

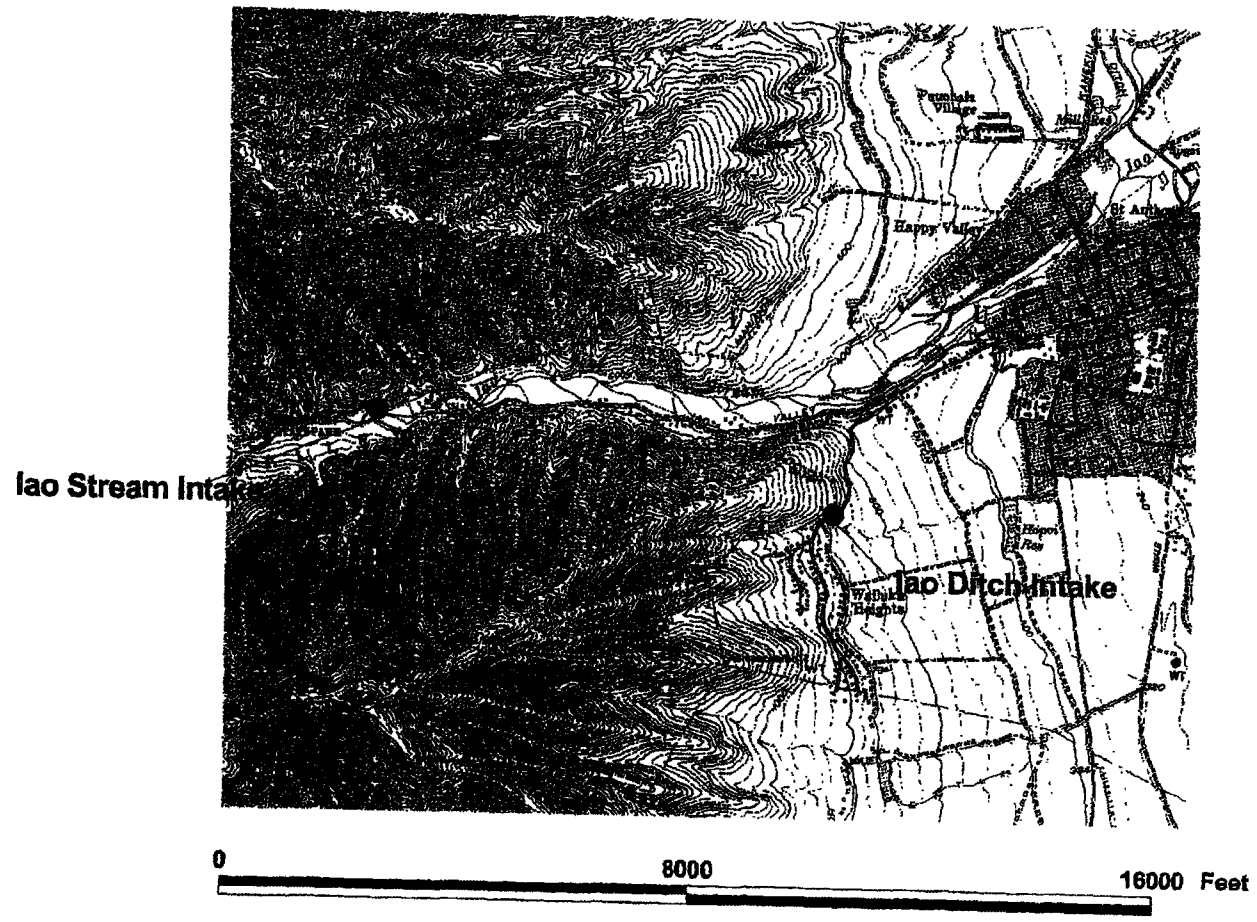
Surface water is defined in §174C-3 as *both contained surface water - that is, water upon the surface of the earth in bounds created naturally or artificially including, but not limited to, streams, other watercourses, lakes, reservoirs, and coastal waters subject to state jurisdiction - and diffused surface water - that is, water occurring upon the surface of the ground other than in contained waterbodies. Water from natural springs is surface water when it exits from the spring onto the earth's surface.*

**PUBLIC INTEREST**

Explain how the uses in your application are consistent with the public interest as described in §174C-2(c). *(t)he state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision 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. Such objectives are declared to be in the public interest.*

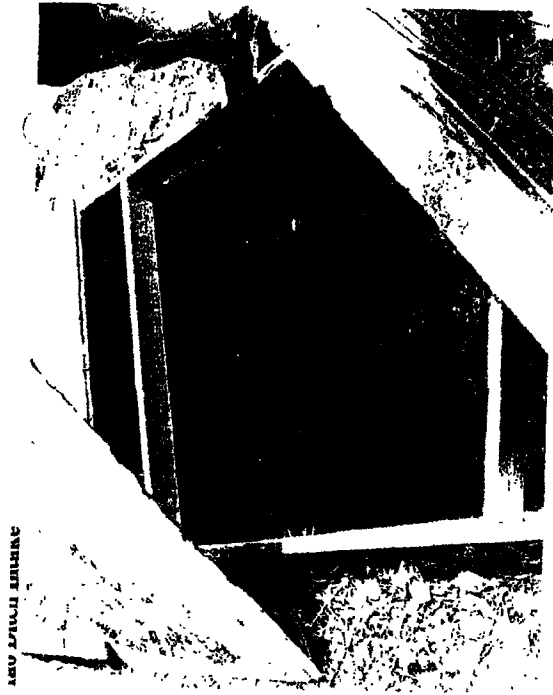
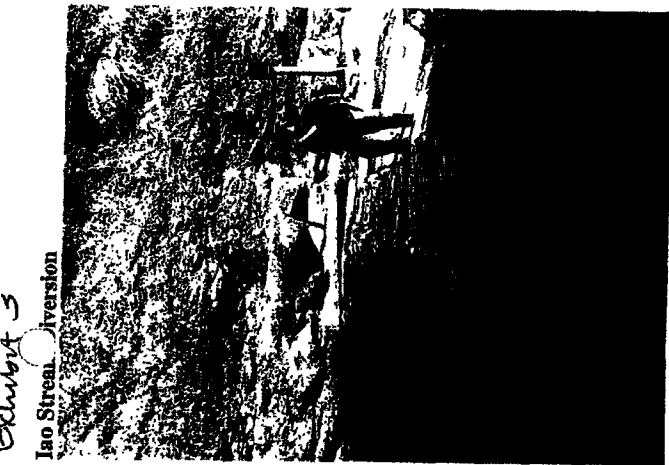
EXHIBIT 1

## Iao Ditch, Waipuku, Maui, Hawaii





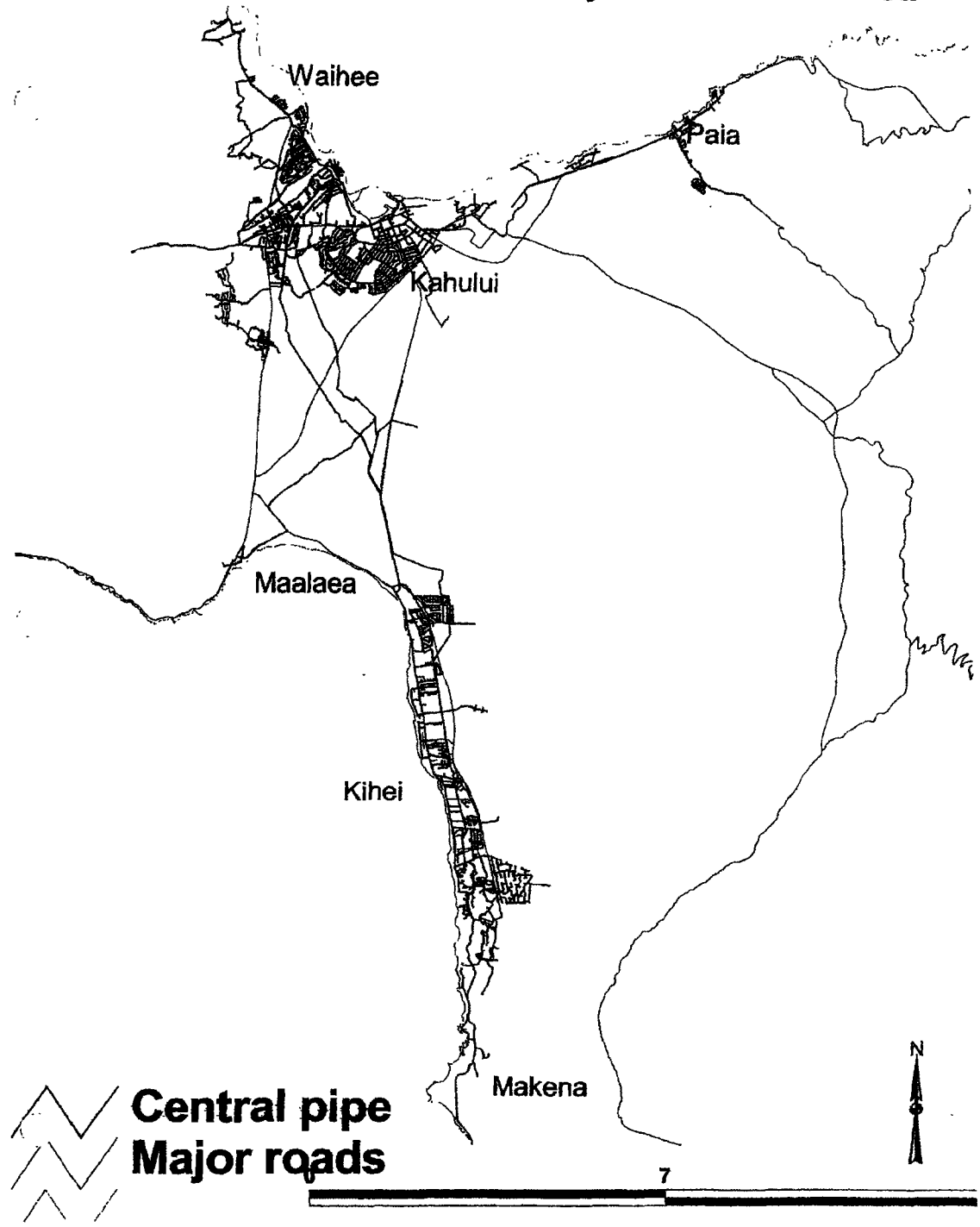




Lao Ditch Intake Improvements



# Exhibit 4 : Central Maui System Service Area



CHARMAINE TAVARES  
Mayor



JEFFREY K. ENG  
Director  
ERIC H. YAMASHIGE, P.E., L.S.  
Deputy Director

**DEPARTMENT OF WATER SUPPLY**  
**COUNTY OF MAUI**  
200 SOUTH HIGH STREET  
WAILUKU, MAUI, HAWAII 96793-2155  
www.mauiwater.org

March 31, 2009

Honorable Laura H. Thielen, Chairperson  
Commission on Water Resource Management  
State of Hawaii Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawaii 96809

Dear Chairperson Thielen:

Subject: Application for Surface Water Use Permit for New Use in the Na Wai Eha, Maui,  
Surface Water Management Areas

Please find attached 15 copies of the Maui County Department of Water Supply's (DWS) "new use" Water Use Permit Application Form SWUPA-N for 1.416 mgd from the Iao Ditch. In some instances, the format of the SWUPA-N form did not seem to be applicable to a municipal purveyor of water such as DWS and we therefore provide supplemental and clarifying information to this form below.

**Land Use Consistency and Efficiency**

Land use consistency and efficiency of use must be described in relation to the Central Maui System as a whole, as Iao ditch along with DWS wells in Iao and Waihee aquifers are mixed so that the Iao ditch source can serve different areas within the system. In lieu of Table 1 "Land Use Consistency/Efficiency" on Form SWUPA-N, please find below water use categories, quantity in gallons per day, and number of services per water use category for active and inactive meters issued as of December 31, 2008. The requested amount of 1.416 mgd would allow withdrawals from Iao ditch within our allocation from Wailuku Water Company (WWC). Our current agreement with WWC "Second Amendment to Agreement Concerning Withdrawal from the Iao/Waikapu Ditch" dated February 27, 2008 makes available 3.2 mgd. Improvements to the Iao ditch intake are completed which allow us to achieve optimum productivity of the Iao treatment plant. Please refer to attached pictures in exhibit 3. Increased withdrawals from Iao ditch would allow less reliance on South Waihee aquifer and increased DWS compliance with system standards. As stated in our existing use application for this source, DWS has withdrawn municipal supply from Iao ditch since the 1930s. The requested amount would serve existing and anticipated uses throughout the Central

*"By Water All Things Find Life"*

The Department of Water Supply is an Equal Opportunity provider and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410. Or call (202) 720-5964 (voice and TDD)

Printed on recycled paper



Maui system. Therefore the requested amount per water use category from Iao ditch is the percentage of active and inactive installed meter use that each water use category represents of the total water use for the Central Maui system.

Current state land use district and County zoning codes can not be identified for all existing individual meters on the Central Maui system. However, building permits for new homes and businesses requires underlying appropriate zoning and State land use district for approval.

Table 1: Land Use Consistency/Efficiency

| Water Use Category    | # Active<br>meters<br>per<br>12/31/08 | AVG Use<br>GPD per<br>12/31/08 | AVG<br>GPD/<br>service | #<br>Inactive<br>meters<br>per<br>12/31/08 | AVG<br>Monthly<br>Inferred<br>Use per<br>12/31/08 | AVG<br>GPD/<br>service | Class<br>Use<br>/Total use<br>in % | Requested<br>amount GPD |
|-----------------------|---------------------------------------|--------------------------------|------------------------|--------------------------------------------|---------------------------------------------------|------------------------|------------------------------------|-------------------------|
| AGRICULTURE           | 19                                    | 212,515                        | 11,185                 |                                            |                                                   |                        | 1.07%                              | 15,093.50               |
| GOVERNMENT            | 208                                   | 1,688,281                      | 8,117                  | 1                                          | 48,000                                            | 48,000                 | 871.00%                            | 123,316.28              |
| COMMERCIAL            | 881                                   | 2,235,767                      | 2,538                  | 17                                         | 86,222                                            | 5,072                  | 1165.00%                           | 164,915.15              |
| GOLF PRIVATE          | 2                                     | 357                            | 179                    |                                            |                                                   |                        | 0.00%                              | 25.36                   |
| HOTEL                 | 72                                    | 1,680,498                      | 23,340                 |                                            |                                                   |                        | 843.00%                            | 1,119,354.39            |
| INDUSTRIAL            | 149                                   | 720,981                        | 4,839                  | 3                                          | 13,700                                            | 4,567                  | 368.00%                            | 52,179.41               |
| IRRIGATION PRIVATE    | 46                                    | 201,962                        | 4,390                  | 7                                          | 57,300                                            | 8,186                  | 130.00%                            | 18,413.62               |
| MULTI FAMILY          | 512                                   | 3,032,910                      | 5,924                  | 8                                          | 114,411                                           | 14,301                 | 1579.00%                           | 223,532.89              |
| MULTI FAMILY LOW RISE | 9                                     | 175,340                        | 19,482                 |                                            |                                                   |                        | 88.00%                             | 12,453.21               |
| RELIGIOUS             | 84                                    | 100,826                        | 1,200                  |                                            |                                                   |                        | 51.00%                             | 7,160.99                |
| SCHOOL PRIVATE        | 1                                     | 3,637                          | 3,637                  |                                            |                                                   |                        | 2.00%                              | 258.31                  |
| SINGLE FAMILY         | 17005                                 | 9,083,415                      | 534                    | 362                                        | 319,759                                           | 883                    | 4716.00%                           | 667,843.75              |
| UNKNOWN               | 15                                    | 37,659                         | 2,511                  | 9                                          | 123,600                                           | 13,733                 | 81.00%                             | 11,453.13               |
| TOTAL:                | 19,003                                | 19,174,148                     |                        | 407                                        | 762,992                                           |                        | 100.00%                            | 1,416,000.00            |

#### Irrigation Information

At this time DWS does not serve non-potable water on our Central Maui system. Some preliminary research of potential commercial projects where reclaimed water can off-set potable sources have been initiated in the Water Use and Development Plan (WUDP) process. DWS strongly encourages new developments to utilize non-potable sources where available, such as on site brackish wells. Commercial properties are required to use reclaimed water for non potable needs if located within 100 feet of a R-1 reclaimed water distribution line

#### Alternative Analysis

DWS notes that the various categories on CWRM's Table 3 are not specified in the State Water Code. HRS § 174C-49 sets forth the criteria that applicants must meet. Nonetheless, DWS addresses each category on Table 3 to the best of its ability. In doing so, DWS does not waive its legal objections to the imposition of these specific categories. DWS has no real, practical alternatives to the requested new uses. DWS has considered drilling new wells in the Northern portion of the Waihee aquifer and in the Kahakuloa aquifer, but CWRM has asked DWS to limit

March 31, 2009  
Laura H. Thielen, Chairperson  
Commission On Water Resource Management  
Page 3

its withdrawals from the Waihee aquifer. Recent discussions with USGS have led DWS to conclude that new wells in these areas may not be as productive or cost-effective as previously hoped. USGS has advised DWS that the Waikapu aquifer may be a better place to seek new sources of supply and since 2006 (FY 2007) DWS has budgeted and received County Council approval for well development in the Waikapu aquifer. However, the current sustainable yield of that aquifer is 3 mgd, and DWS faces competition from private landowners for the available water in the Waikapu aquifer.

Moreover, DWS is precluded from developing more wells in East Maui in the immediate future due to the entry on December 22, 2003 of a consent decree in The Coalition to Protect East Maui Water Resources et al. v. Board of Water Supply et al., Civil No. 03-1-0008(3). In that case, the Plaintiffs demanded that before looking to East Maui as a source of groundwater, DWS look first to surface water drawn from the Waikapu, Iao, and/or Waihee hydrologic units. Therefore, DWS has vigorously pursued surface water sources as required under the Consent Decree.

CWRM's chart does not include conservation as a specific category, but DWS recognizes that conservation efforts can be a very cost effective way to stretch a limited water supply. DWS's conservation efforts include a program that provides low-flow fixtures, free of charge, and public education programs. These efforts have been successful in reducing demand by about 500,000 gallons per day. DWS has stepped up conservation efforts with additional conservation staff responsible for leak detection in water systems, commercial and industrial operations, residences, and irrigation systems; repair or arranging for repair of leaks and other problems identified; replacement of fixtures as appropriate; suggestions for plant materials as appropriate; analysis and presentation of findings; and public presentations and meetings with community groups and homeowners' associations to increase awareness of and compliance with good conservation practices.

A request for a voluntary 10 % reduction in water use from customers on the Central Maui has been remarkably successful in achieving the voluntary cutback goal of 25.5 mgd, even in the dry summer months.

We respectfully request that the Commission on Water Resource Management issue a "new use" Surface Water Use Permit to DWS for 1.416 mgd from the Iao Ditch. We also ask that you please copy Deputy Corporation Counsel Jane Lovell with all correspondence relating to this "new use" application.

Sincerely,



Jeffrey K. Eng  
Director  
emb

March 31, 2009

Laura H. Thielen, Chairperson

Commission On Water Resource Management

Page 4

c: Engineering Division

Jane Lovell, Deputy Corporation Counsel

Ed Kushi, Jr. Deputy Corporation Counsel

attachments:

Iao Ditch Water Use Permit Application Form SWUPA-N (15 copies) with 4 exhibits:

1. USGS Topographic map
2. Property Tax Map Key maps
3. Photographs of stream diversion and ditch intake
4. GIS map of end use/service areas



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

APPLICATION FOR SURFACE WATER USE PERMIT FOR  
PROPOSED NEW USE IN A DESIGNATED SURFACE WATER  
MANAGEMENT AREA

FORM SWUPA-N

- ☒ Application for New use  
☐ Application to Modify SWUP No. \_\_\_\_\_

For Official Use Only:

For detailed instructions on filling out this application form completely, refer to the attached instructions sheet.  
Incomplete applications will not be accepted for processing.

The following must be attached before this application is accepted as complete:

- Portion of 7.5-Minute Series USGS topographic map (scale 1:24,000) labeled with stream and diversion location and the quad map name.
- Property tax map showing the stream or diversion location and location of water use referenced to established property boundaries.
- Photograph(s) of the surface water source, diversion and end use, if applicable.

**APPLICANT INFORMATION:** NOTE: In accordance with HRS §174C-51(1)(B), in the event a lessee, licensee, developer, or any other person with a terminable interest or estate in the land which is the water source of the permitted water, applies for a water permit, the landowner shall be stated as a joint applicant for the water permit.

|                                                                                                                   |                                        |                                                        |                                                                           |                               |                                   |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------|-----------------------------------|
| <b>1. APPLICANT'S NAME</b><br>MAUI COUNTY DEPARTMENT<br>OF WATER SUPPLY                                           |                                        | <b>Applicant's Contact</b><br>Jeffrey K. Eng, Director | <b>2. SOURCE LANDOWNER'S NAME</b><br>NOT APPLICABLE PER HRS 174C-51(1)(B) |                               | <b>Source Landowner's Contact</b> |
| <b>Applicant's Mailing Address, or Principal Place of Business</b><br>200 S. High Street<br>Wailuku, Hawaii 96793 |                                        |                                                        | <b>Source Landowner's Mailing Address, or Principal Place of Business</b> |                               |                                   |
| <b>Applicant's Phone</b><br>808 270 7816                                                                          | <b>Applicant's Fax</b><br>808 270 7833 | <b>Applicant's E-mail</b><br>jeffrey.eng@co.maui.hi.us | <b>Source Landowner's Phone</b>                                           | <b>Source Landowner's Fax</b> | <b>Source Landowner's E-mail</b>  |

**SOURCE INFORMATION**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>3. SURFACE WATER HYDROLOGIC UNIT:</b> Island: MAUI Hydrologic Unit: IAO Hydrologic Unit Code: 6024                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| <b>4. STREAM FLOW STANDARD (IFS) FOR HYDROLOGIC UNIT IF APPLICABLE:</b> NOT ESTABLISHED                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <b>5. CAN YOUR PROPOSED USE(S) BE ACCOMMODATED WITHIN THE ABOVE AMOUNTS:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>Explain how your proposed use(s) can be accommodated within the existing IFS for the above hydrologic unit:<br>NO IFS ESTABLISHED                                                                                                                                                                                                                                                   |  |
| <b>6a. TMK OF PROPOSED STREAM DIVERSION LOCATION:</b> Zone: 3 - Sec: 5 - Plat: 003 - Parcel: 003                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| <b>6b. TMK OF PROPOSED DITCH DIVERSION LOCATION:</b> Zone: 3 - Sec: 5 - Plat: 001 - Parcel: 067                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <b>7a. PROPOSED STREAM DIVERSION:</b> How will water be diverted from the stream to your property? Check all that apply.<br><input checked="" type="checkbox"/> Pipe <input type="checkbox"/> Pump <input checked="" type="checkbox"/> Ditch/auwai <input type="checkbox"/> Other Describe: From Iao Stream to Iao-Waikapu ditch. Pipe from ditch to treatment plant                                                                                                                                                                    |  |
| <b>7b. WILL THE DIVERTED WATER BE RETURNED TO THE STREAM OR DITCH?</b><br><input type="checkbox"/> Yes. How much water will be returned?<br><input checked="" type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                      |  |
| <b>8. PROPOSED FLOW MEASUREMENT INFORMATION:</b><br>Will the stream diversion have a flow meter with totalizer or other device to measure diverted amounts?<br><input checked="" type="checkbox"/> Yes. List the manufacturer and describe the device. Wailuku Water Co's meter at ditch intake, unknown manufacturer. DWS effluent<br><input type="checkbox"/> No. Explain how stream diversion will be measured or estimated to justify amounts requested in the space below.<br>meters at each of three treatment plant filter units |  |

**PROPOSED USE INFORMATION** HRS §174C-51(4), (5), (6)

|                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>9. TOTAL QUANTITY OF WATER REQUESTED:</b> 1,416,000 gallons per day. See Table 1, Item 14.                                                                                                                                                                                                         |
| <b>10. PROPOSED USE:</b> Check all that apply. <input type="checkbox"/> Agriculture <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial<br>See Table 1, Item 1. <input type="checkbox"/> Irrigation <input type="checkbox"/> Military <input checked="" type="checkbox"/> Municipal |
| <b>11. LOCATION OF PROPOSED WATER USE:</b> Show the location of the proposed use on the same USGS and TMK maps as the proposed source location. Otherwise, attach similar maps. See Table 1, Item 2.                                                                                                  |

**PROPOSED USER INFORMATION**

|                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>12. APPURTENANT RIGHT:</b> Do you claim an appurtenant right for your proposed water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>If yes, has the appurtenant right been established by the courts or the Commission? <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <b>13. PROPOSED END USER INFORMATION:</b> Will you be an end user on an existing water system?<br><input type="checkbox"/> Yes. List the name of the system operator: <input checked="" type="checkbox"/> No                                                                                                     |
| <b>14. REGISTRATION AND DECLARATION OF WATER USE:</b> Do you have a Registration and Declaration of Water Use from the Commission?<br><input type="checkbox"/> Yes. List the file reference name(s): <input checked="" type="checkbox"/> No                                                                      |
| <b>15. STREAM DIVERSION WORKS PERMIT (SDWP):</b> Do you have a SDWP from the Commission?<br><input type="checkbox"/> Yes. List the permit number(s): <input checked="" type="checkbox"/> No                                                                                                                      |

NOTE: Signing below indicates that the signatories understand and affirm that the information provided on this application is accurate and true to the best of their knowledge. Furthermore, the signatories understand that: 1) if necessary, additional information may be required before the application is considered complete; 2) if a water use permit is granted by the Commission, this permit will be subject, but not limited to, any existing legal uses, changes in sustainable yields and instream flow standards, Hawaiian Home Lands uses, and any other conditions imposed by the Commission; and 3) the applicant is responsible for paying the required public notice fees associated with this application.

|                                                                                                                    |                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>16. APPLICANT</b><br>Signature: <u>Jeffrey K. Eng</u><br>Jeffrey K. Eng<br>Print: _____<br>Date: <u>3/31/09</u> | <b>17. SOURCE LANDOWNER</b><br>Signature: _____<br>Not Applicable per HRS 174C-51(1)(B)<br>Print: _____<br>Date: _____ |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|

# APPLICATION FOR SURFACE WATER USE PERMIT - PROPOSED NEW USE

## TABLE 1: LAND USE CONSISTENCY / EFFICIENCY

(Attach additional copies of Table 1 if necessary.)

| LAND USE CONSISTENCY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                               |                         |                                                                                                                               |                    | EFFICIENCY OF USE                                                                                                             |                      |                                        |                                 |                                                             |                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------|---------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2                                                                                                                                                                                                             | 3                       | 4                                                                                                                             | 5                  | 6                                                                                                                             | 7                    | 8                                      | 9                               | 10                                                          | 11                                                                                                                                                                             |
| PURPOSE / WATER USE CATEGORY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TMK FOR PROPOSED LOCATION OF USE<br>ATTACH THE FOLLOWING:<br>• Property tax map, showing proposed location of use referenced to established property boundaries.<br>• Photograph of the area of proposed use. | STATE LAND USE DISTRICT | CDUP RBO'D<br>Check the appropriate box, and write in the date approved, if applicable.                                       | COUNTY ZONING CODE | SNAP REQ'D<br>Check the appropriate box, and write in the date approved, if applicable.                                       | UNITS OR NET ACREAGE | GPD/UNIT or GPD/ACRE (Gallons per Day) | REQUESTED QUANTITY OF USE (GPD) | SUB-METERED? Check Yes or No                                | APPLICANT'S JUSTIFICATION FOR REQUESTED QUANTITY OF USE FOR ITEM 9. If applicable, attach sheets to show how this number was calculated. For Irrigation uses, fill in Table 2. |
| <b>Uses that require potable (drinking) water</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                               |                         |                                                                                                                               |                    |                                                                                                                               |                      |                                        |                                 |                                                             |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
| <b>TOTAL POTABLE USE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                               |                         |                                                                                                                               |                    |                                                                                                                               |                      |                                        |                                 | <sup>12</sup> GPD                                           |                                                                                                                                                                                |
| <b>Uses that do not require potable water</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                               |                         |                                                                                                                               |                    |                                                                                                                               |                      |                                        |                                 |                                                             |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zone - Sec - Plat - Parcel                                                                                                                                                                                    |                         | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                    | <input type="checkbox"/> Yes, date approved: / /<br><input type="checkbox"/> Yes, not acquired<br><input type="checkbox"/> No |                      |                                        |                                 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |                                                                                                                                                                                |
| <b>TOTAL NON POTABLE USE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                         |                                                                                                                               |                    |                                                                                                                               |                      |                                        |                                 | <sup>13</sup> GPD                                           |                                                                                                                                                                                |
| <b>TOTAL QUANTITY OF WATER REQUESTED (Sum of Total Potable Use and Total Non-Potable Use above) =</b>                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                               |                         |                                                                                                                               |                    |                                                                                                                               |                      |                                        |                                 | <sup>14</sup> GPD                                           |                                                                                                                                                                                |
| <p>15. Please explain if there are any limitations (legal, contractual, etc.) on the use(s) of water described above. §174C-51(5) HRS</p> <p>Per agreement with Waialuku Water Company LLC (WWC) entered into June 9, 2004, first amendment made November 20, 2007 and second amendment made February 27, 2008 DWS is entitled to withdraw up to 3.2GD except as notified by WWC when Iao Stream flow is below 11.5 MGD as measured at the USGS gauging station at Iao Stream at Kepaniwai Park, Waialuku</p> |                                                                                                                                                                                                               |                         |                                                                                                                               |                    |                                                                                                                               |                      |                                        |                                 |                                                             |                                                                                                                                                                                |

# APPLICATION FOR SURFACE WATER USE PERMIT - PROPOSED NEW USE

**TABLE 2: IRRIGATION INFORMATION**

List all crops that will be grown as separate line items and include landscape and golf course irrigation.  
Attach additional copies of Table 2 if necessary.

| 1                                                                                                    | 2    | 2             | 4                     | 5                           | 6                         | 7                                             | 8                                               |
|------------------------------------------------------------------------------------------------------|------|---------------|-----------------------|-----------------------------|---------------------------|-----------------------------------------------|-------------------------------------------------|
| TMK OF PROPOSED LOCATION OF USE<br>(Attach TMK map outlining area and photos for each proposed use.) | CROP | TOTAL ACREAGE | NET IRRIGATED ACREAGE | BEGIN GROWTH PERIOD (Month) | END GROWTH PERIOD (Month) | IRRIGATION SYSTEM<br>(Refer to instructions.) | IRRIGATION PRACTICE<br>(Refer to instructions.) |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |
| Zone - Sec - Plat : Parcel                                                                           |      |               |                       |                             |                           |                                               |                                                 |

## 9. COMMENTS:

At this time the Department does not serve non-potable water on our Central Maui system. While less than 2 percent of total Central Maui use is classified as irrigation meters, irrigation needs for other use categories could vary between 30 - 70 percent. Some preliminary research of potential commercial projects where reclaimed water can off-set potable sources have been initiated in the Water Use and Development Plan (WUDP) process. The Department strongly encourages new developments to utilize non-potable sources where available, such as on site brackish wells. Commercial properties are required to use reclaimed water for non potable needs if located within 100 feet of a R-1 reclaimed water distribution line

# APPLICATION FOR SURFACE WATER USE PERMIT - PROPOSED NEW USE

TABLE 3: ALTERNATIVES ANALYSIS AND ADDITIONAL REQUIREMENTS

|                   | A. Analysis of Potable Alternatives (Attach additional sheets if necessary.)                                                                                                                                                                                                                | B. Analysis of Non-Potable Alternatives (Attach additional sheets if necessary.)                                                                                                                                                                                                                            |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Municipal sources | Existing municipal sources are used to the extent possible with consideration to system capacity, water quality, pumping permits and various operational reasons to meet current demand                                                                                                     |                                                                                                                                                                                                                                                                                                             |
| Wastewater reuse  |                                                                                                                                                                                                                                                                                             | Expansion of the recycled water system require further quantification of end-uses and technical potential. Due to extensive capital costs and needed funding by private parties and other agencies in addition to DWS, this is a long-term goal, rather than an alternative that is available at this time. |
| Ditch system      | DWS does not own or operate a ditch system and is using Iao/Waikapu ditch to serve current demand. DWS had preliminary discussions with A&B concerning the potential for expansion of surface water treatment but ditch water availability depends on the Na Wai Eha allocations            |                                                                                                                                                                                                                                                                                                             |
| Desalinization    | A plant for desalinization of Central Maui brackish ground water for potable and non-potable needs would have extensive energy needs and could potentially require new generation plants. Other                                                                                             | issues are cost volatility, and disposal of brine. This strategy does not present a viable alternative to meet current demand                                                                                                                                                                               |
| Ground water      | Well development in N. Waihee, Kahakuloa, Waikapu, Haiku or Honpou aquifers may not be as productive or cost-effective as expected or feasible at all at this time. The requested new use would allow less reliance on South Waihee aquifer                                                 |                                                                                                                                                                                                                                                                                                             |
| Other (specify)   | DWS conservation efforts include low-flow fixture distribution, public education, leak detection and water audits that are stepped up through additional conservation staff. Voluntary water restrictions on the Central Maui system have succeeded in achieving the voluntary cutback goal | of 25.5 mgd                                                                                                                                                                                                                                                                                                 |

## C. ADDITIONAL REQUIREMENTS:

**PUBLIC INTEREST** Hawaii Revised Statutes §174C-2(c) states that: *The state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision 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. Such objectives are declared to be in the public interest.*

1. Explain below how your proposed new use(s) will maximize beneficial use(s) and how they will be deemed to be in the public interest as defined by the State Water Code above.

DWS's withdrawals from Iao ditch is mixed with Iao and Waihee aquifer sources to serve the Central Maui system, which currently serves 21,450 meters. Domestic uses, such as single- and multi-family uses, account for about two-thirds of the Central Maui system services. The remaining one-third serves commercial, industrial, and agricultural uses. A portion of these uses serve non-potable uses and is supplemented by reclaimed and brackish water for irrigation. We understand that domestic uses are protected public trust uses and are entitled to high priority under the public trust doctrine. CWRM concluded on February 15, 2006 and January 31, 2007 that DWS's basal source withdrawals serve the public interest. Iao ditch withdrawals serve the public interest in the same way. DWS provides for the protection and preservation of ground and surface water resources through conservation and resource protection programs.

2. Explain below how your proposed new use(s) will not interfere with any existing legal use(s).

Per agreement entered into June 9, 2004, first amendment made November 29, 2007 and second amendment made February 27, 2008 DWS is entitled to withdraw up to 3.2 MGD except as notified by WWC when Iao Stream flow is below 11.5 MGD as measured at the USGS gauging station at Iao Stream at Kepaniwai Park, Wailuku. The existing diversion from Iao stream by WWC is the Interim Instream Flow Standard (IIFS) and legal use. According to WWC's Opening Statement in Case No CCH-MA06-01, page 18 and Exhibit A, existing established uses (maximum potential diversion) from Iao stream represents 20 mgd diversion. 12 end users are identified as withdrawing from Iao-Waikapu ditch of which DWS's allocation of 3.2 mgd is included. With the amendment of the IIFS, DWS supports returning water to the streams that is not a reasonable-beneficial use.

3. Explain below how your proposed new use(s) will not interfere with the rights of the Department of Hawaiian Home Lands as provided in Section 221 of the Hawaiian Homes Commission Act.

DWS's Central Maui system serves homes built by the Department of Hawaiian Homelands (DHHL). DWS places a high priority on DHHL residential projects and although DWS ceased to issue reservations in the Central Maui system post designation of Iao aquifer, exemptions were made for DHHL so that water could be secured for planned expansion of Hawaiian Home Lands residential projects.

# APPLICATION FOR SURFACE WATER USE PERMIT PROPOSED NEW USE

## INSTRUCTIONS

This application form is for new surface water uses or for a modification of a previously approved water use permit in designated surface water management areas. New surface water uses are proposed uses after the effective date of designation of the surface water management area. Please check the appropriate box.

**Do not use this form for existing surface water use applications.** Existing surface water uses are actual uses before the effective date of designation. Please use Form SWUPA-E for existing uses.

Most questions can be addressed by visiting our website at: [www.hawaii.gov/dlnr/cwrn](http://www.hawaii.gov/dlnr/cwrn), or contacting us at 587-0234, or by email at: [dlnr.cwrn@hawaii.gov](mailto:dlnr.cwrn@hawaii.gov). The current application forms are also available at: [www.hawaii.gov/dlnr/cwrn/resources\\_permits.htm](http://www.hawaii.gov/dlnr/cwrn/resources_permits.htm).

### REQUIREMENTS FOR A COMPLETE APPLICATION

1. Fill in the most recent application form. A current form is available at our web site or by contacting us at 587-0234.
2. Print in ink or type in the information on the application.
3. Fill in every item in the application form (page 1) and Tables 1, 2, and 3 as it relates to your proposed new use or permit modification.
4. Enclose a check for the non-refundable filing fee of \$25 payable to: Department of Land and Natural Resources. Government agencies are not required to pay the filing fee.
5. Pay for the cost of publishing any required public notices related to your application. The current cost for publishing public notices is approximately \$400.00. Commission staff will provide instructions later in the permit process regarding payment of these costs.
6. Mark the source and end use locations on the appropriate USGS quad map (scale 1:24,000) and property tax (TMK) map and attach these maps to your application.
7. Attach photos showing your existing diversion, measuring device(s) (if applicable) and end use areas.
8. Sign the application form in ink. Both the applicant and the landowner where the source is located must sign the application form.
9. Submit the original application and 15 copies of the application form and all attachments (maps, photos and any other attachments) and filing fee to: Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809.

### ADDITIONAL REQUIREMENTS FOR A COMPLETED APPLICATION

Per Hawaii Revised Statutes §174C-49, the applicant must establish that the proposed new use of surface water:

1. Can be accommodated with the available water source.
2. Is a reasonable-beneficial use.\*
3. Will not interfere with any existing legal use of water.
4. Is consistent with the public interest.\*\*
5. Is consistent with state and county general plans and land use designations.
6. Is consistent with county land use plans and policies.
7. Will not interfere with the rights of the Department of Hawaiian Home Lands as provided in Section 221 of the Hawaiian Homes Commission Act.

\*HRS §174C-3 of the State Water Code states: "Reasonable-beneficial use" means the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest.

\*\*HRS §174C-2(c) of the State Water Code states that: (1)the state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision 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. Such objectives are declared to be in the public interest

**NOTE:** Filling in the application form and Tables 1, 2, and 3 completely will address the requirements of HRS §174C-49

### LINE BY LINE INSTRUCTIONS ON APPLICATION

#### **APPLICANT INFORMATION**

In accordance with the Hawaii Water Code, both the applicant and the person who owns the property where the water source is located are required to apply for a water use permit. §174C-51(1)(B), HRS, states, *In the event a lessee, licensee, developer, or any other person with a terminable interest or estate in the land, which is the water source of the permitted water, applies for a water permit, the landowner shall also be stated as a joint applicant for the water permit.*

1. **APPLICANT'S NAME:** Fill in the information for the applicant. This should be the person who will be responsible for all conditions of the water use permit.
2. **SOURCE LANDOWNER'S NAME:** Fill in the information for the landowner of the property where the existing surface water diversion works is located.

#### **SOURCE INFORMATION**

3. **SURFACE WATER HYDROLOGIC UNIT AND CODE:** Enter the appropriate island, hydrologic unit name, and hydrologic code where the proposed source is located. The "source" is the stream from which water is diverted to the user. For information on hydrologic unit names and unit codes please refer to the *Surface Water Hydrologic Unit: A Management Tool for Instream Flow Standards* report available on the CWRM website at: <http://www.hawaii.gov/dlnr/cwrn/>, or contact CWRM staff at (808) 587-0234. You may also contact CWRM toll-free from Maui at: 984-2400, ext. 70234.

# APPLICATION FOR SURFACE WATER USE PERMIT PROPOSED NEW USE

4. **INSTREAM FLOW STANDARD (IFS) FOR HYDROLOGIC UNIT:** Provide Instream Flow Standard (IFS) for hydrologic unit if available.
- CAN YOUR PROPOSED USE BE ACCOMMODATED WITHIN THE ABOVE AMOUNTS:** Check "Yes" or "No." Explain how your proposed use(s) can be accommodated within the Instream Flow Standard (IFS) for the above hydrologic unit.
- 6a. **TMK OF PROPOSED STREAM DIVERSION LOCATION:** Fill in the Tax Map Key (TMK) number of the tax parcel where the stream diversion will be located. Each tax parcel is issued a TMK number by the county property tax office and is defined as follows: 1st digit = (Island code), 2nd digit = Zone, 3rd digit = Section, Digits 4-6 = Plat, Digits 7-10 = Parcel, e.g. (1) 1-1-001:001. To find out your TMK number, call Maui County Real Property Tax Division at: (808) 270-7297, or check online at: [www.mauipropertytax.com/](http://www.mauipropertytax.com/)
- 6b. **TMK OF PROPOSED DITCH DIVERSION LOCATION:** Fill in the Tax Map Key (TMK) number of the parcel where the proposed ditch diversion will be located.
- 7a. **PROPOSED STREAM DIVERSION:** How will water be diverted from the stream to your property? Check all the appropriate box(es).
- 7b. **WILL THE DIVERTED WATER BE RETURNED TO THE STREAM OR DITCH?** Check "Yes" or "No." If yes, enter the amount of water to be returned.
8. **PROPOSED FLOW MEASUREMENT INFORMATION:** Check "Yes" or "No". If yes, please describe the measuring device. A flowmeter with a totalizer will directly measure the total use for the source (similar to a car's odometer). If no, explain how stream diversion will be measured or estimated to justify amounts requested.

## PROPOSED USE INFORMATION (HRS §174C-51(4), (5), (6))

9. **TOTAL QUANTITY OF WATER REQUESTED:** Enter the amount of water requested as gallons per day (GPD). Fill out Table 1 and enter the amount in Box 14, "Total Use Requested."
10. **PROPOSED USE:** Check all the boxes that apply for the proposed use. Refer to the instructions for Table 1: Land Use Consistency/Efficiency of Use, Item 1: Purpose/Water Use Category below to determine which water use category to use.
11. **LOCATION OF PROPOSED WATER USE:** Show the location of the proposed use on the same USGS and TMK maps as the proposed source location. Otherwise, attach similar maps and show the location of the proposed use.

## PROPOSED USER INFORMATION

12. **APPURTENANT RIGHT:** An appurtenant water right is a legally recognized right to a specific amount of surface freshwater – usually from a stream – on the specific property that has that right. This right traces back to the first time the land was converted to fee simple title; i.e., the Great Mahele and the issuance of either a Land Commission Award or Royal Patent. The quantity of water under the appurtenant right is the amount that was being used on the land shortly before or at the time of the Mahele. Do you claim an appurtenant right for your proposed water use? Check "Yes" or "No." If yes, has your appurtenant right been established by the courts or the Commission? Check "Yes" or "No."
13. **PROPOSED END USER INFORMATION:** Will you be an end user on an existing water system? Check "Yes" or "No." If yes, please list the name of the water system operator.
14. **REGISTRATION AND DECLARATION OF WATER USE:** Do you have a Registration and Declaration of Water Use from the Commission? Check "Yes" or "No". If yes, list the name of the registrant(s).
15. **STREAM DIVERSION WORKS PERMIT (SDWP):** Have you ever been issued a SDWP by the Commission? If yes, please list the permit number(s). Otherwise, check "No."
16. **APPLICANT:** Sign and print your name, and date your application
17. **SOURCE LANDOWNER:** Sign and print your name, and date your application. The landowner of the source shall be a joint applicant in the event the applicant is a lessee, licensee, developer, or any other person with a terminable interest or estate in the land which is the water source of the permitted water. §174C-51(1)(B)

## TABLE 1: LAND USE CONSISTENCY / EFFICIENCY OF USE

Provide information on all of the proposed uses you are applying for or seeking to modify. In the space provided below the table or on a separate sheet, explain whether there are any limitations (e.g., a contract or other legal agreement(s)) on your proposed water use(s), as required by §174C-51(5), HRS.

1. **PURPOSE / WATER USE CATEGORY:** For each proposed use, choose one of the categories listed below and enter the appropriate code in the space provided (e.g. AGRAQ, IRRIG, etc.)

### AGRICULTURE

|        |                                     |
|--------|-------------------------------------|
| AGRAQ  | Aquatic Plants & Animals            |
| AGRCP  | Crops & Processing                  |
| AGRLI  | Livestock & Processing, and Pasture |
| AGRON  | Ornamental & Nursery Plants         |
| AGROTH | Other                               |

### DOMESTIC

|         |                                               |
|---------|-----------------------------------------------|
| DOM     | Single & Multi Low-Rise & High-Rise Household |
| DOMN    | Domestic (Non-residential)                    |
| DOMNCB  | Commercial Businesses                         |
| DOMNRI  | Religious Institutions                        |
| DOMNHOS | Hospitals                                     |
| DOMNHOT | Hotels                                        |
| DOMNOB  | Office buildings                              |
| DOMNOTH | Domestic Non-Residential – Other              |
| DOMNSC  | Schools                                       |

# APPLICATION FOR SURFACE WATER USE PERMIT PROPOSED NEW USE

## INDUSTRIAL

INDEL Geothermal, Thermoelectric Cooling, Power Development  
INDFP Fire Protection  
INDMI Mining, Dust Control  
INDOTH Industrial - Other

## IRRIGATION

IRRGF Golf Course  
IRRHM Habitat Maintenance  
IRRHOT Hotel  
IRPLA Landscape/Water Features  
IRROTH Other  
IRRPC Parks  
IRRSC Schools

## MILITARY

MIL Military

## MUNICIPAL

MUNCO County  
MUNPR Privately owned and operated but defined as a public system by the Department of Health  
MUNST State

2. USE TMK: The Tax Map Key number of the parcel over which the water will be applied. There should only be one parcel for each line. Also, attach a TMK map(s) for the lots showing the boundaries of irrigated acreage, etc., as well as a photograph of the area of use.
3. STATE LAND USE DISTRICT: To find out the current Land Use District, contact the Land Use Commission at 587-3822.
4. CDUP REQUIRED: If a Conservation District Use Permit (CDUP) is required, check "Yes" and enter the date CDUP was approved if you have a CDUP applicable to this project; or check "Yes, not acquired". If a CDUP is not required, check "No." To find out if your parcel is in the Conservation District, contact the Land Use Commission at 587-3822. If your parcel is in a Conservation District, contact the Department of Land and Natural Resources Office of Conservation and Coastal Lands at 587-0328 to find out if a CDUP is required.
5. COUNTY ZONING CODE: To find out the Zoning Code for Na Wai Eha, contact Maui County Department of Planning at 270-6279 or 270-7253.
6. SMAP REQUIRED: If a Special Management Area Permit (SMAP) is required, check "Yes" and enter the date SMAP was approved if you have a SMAP applicable to this project; or check "Yes, not acquired". If a SMAP is not required, check "No." To find out if your parcel is in a Special Management Area and requires an SMAP, contact Maui County at 270-8205.
7. UNITS OR NET ACREAGE: This is the value and category as the basis for calculating the duty. "Duty" means the amount of water requested for a "unit" over a specific time period, e.g. gallons per acre per day, or gallons/acre/day. "Unit" can mean dwelling unit, or number of people, or animals. Some examples of this category include: 400 dwelling units, 500 people, and 3.74 acres.
8. GPD/UNIT or GPD/ACRE (GPD=gallons per day): Enter the gallons per day or gallons per acre for each water use category listed in Column #1.
9. REQUESTED QUANTITY OF USE (GPD): Enter the requested quantity of use in gallons per day (GPD) at build out after all phases of your project have been completed. The build out amount may differ from the four-year cumulative projected demand if your build out date extends beyond the cumulative projected four-year demand.
10. SUBMETERED? Is there a second measuring device or meter for another user? Check "Yes" or "No" if the specific use will be submetered or not. Submetering is specific to each line item.
11. APPLICANT'S JUSTIFICATION FOR QUANTITY OF REQUESTED USE FOR ITEM #9: Explain how you are justifying the amount(s) you are requesting for Item #9. Attach additional copies of Table 1 if necessary to show how this number was calculated. For irrigation uses, fill in Table 2.
12. TOTAL POTABLE USE: Add the quantities listed in the column above for potable water and enter the total potable use in gallons per day (GPD) here.
13. TOTAL NON-POTABLE USE: Add the quantities listed in the column above for uses that do not require potable water and enter the total non-potable use in gallons per day (GPD) here.
14. TOTAL QUANTITY OF WATER REQUESTED: Add the requested amounts listed on Box 13 and Box 14 and enter the total requested amount of both potable and non-potable uses here.
15. Please explain if there are any limitations (legal, contractual, etc.) on the use(s) of water described above. HRS §174C-51(5)

## TABLE 2: IRRIGATION INFORMATION

On Table 2, provide the information requested for all the crops you are proposing to grow, including landscape and golf course turf and plants. Enter only one crop and one parcel number (TMK) per line. For multiple crops, list each one as a separate line item. All proposed or modified irrigation uses you are applying for must be listed. Attach additional copies of Table 2, if necessary.

1. USE TAX MAP KEY (TMK): Enter the parcel number where the crop will be grown. Also attach a property tax map with an outline around the area(s) of proposed use(s) and a photograph of each area of the proposed use.
2. CROP: Enter the crop type.
3. TOTAL ACREAGE: Enter the total acreage of the parcel listed.
4. NET IRRIGATED ACREAGE: Enter the acreage that the specific crop will be grown.
5. BEGIN GROWTH PERIOD (MONTH): This is the month of the start of the growth cycle.
6. END GROWTH PERIOD (MONTH): This is the month of the end of the growth cycle.
7. IRRIGATION SYSTEM: Enter one of the following:

TRICKLE, DRIP  
TRICKLE, SPRAY  
MULTIPLE SPRINKLERS

**APPLICATION FOR SURFACE WATER USE PERMIT  
PROPOSED NEW USE**

SPRINKLER, CONTAINER NURSERY  
SPRINKLER, LARGE GUNS  
SEEPAGE, SUBIRRIGATION  
CROWN FLOOD  
FLOOD (TARO)  
OTHER - Please describe in the space provided for Comments.

8. IRRIGATION PRACTICE: Enter one of the following:

IRRIGATE TO FIELD CAPACITY  
APPLY A FIXED DEPTH PER IRRIGATION  
DEFICIT IRRIGATION  
OTHER - Please describe in the space provided for COMMENTS below.

**TABLE 3: ALTERNATIVES ANALYSIS AND ADDITIONAL REQUIREMENTS**

- A. **ALTERNATIVES ANALYSIS:** Please address each alternative and explain why they are or are not available for potable needs. Other alternatives on the last line may include stormwater reclamation, rainwater catchment, etc. that are not already listed above.
- B. **ALTERNATIVES ANALYSIS:** Please address each alternative and explain why they are or are not available for non-potable needs. Other alternatives on the last line may include stormwater reclamation, rainwater catchment, etc. that are not already listed above.

Surface water is defined in §174C-3, HRS as: *...both contained surface water—that is, water upon the surface of the earth in bounds created naturally or artificially including, but not limited to, streams, other watercourses, lakes, reservoirs, and coastal waters subject to state jurisdiction—and diffused surface water—that is, water occurring upon the surface of the ground other than in contained waterbodies. Water from natural springs is surface water when it exits from the spring onto the earth's surface.*

**ADDITIONAL REQUIREMENTS**

1. Explain how your proposed new use(s) will maximize beneficial use(s) and how they will be deemed to be in the public interest as defined by the State Water Code below.

Hawaii Revised Statutes §174C-2(c) states that: *The state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision 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. Such objectives are declared to be in the public interest.*

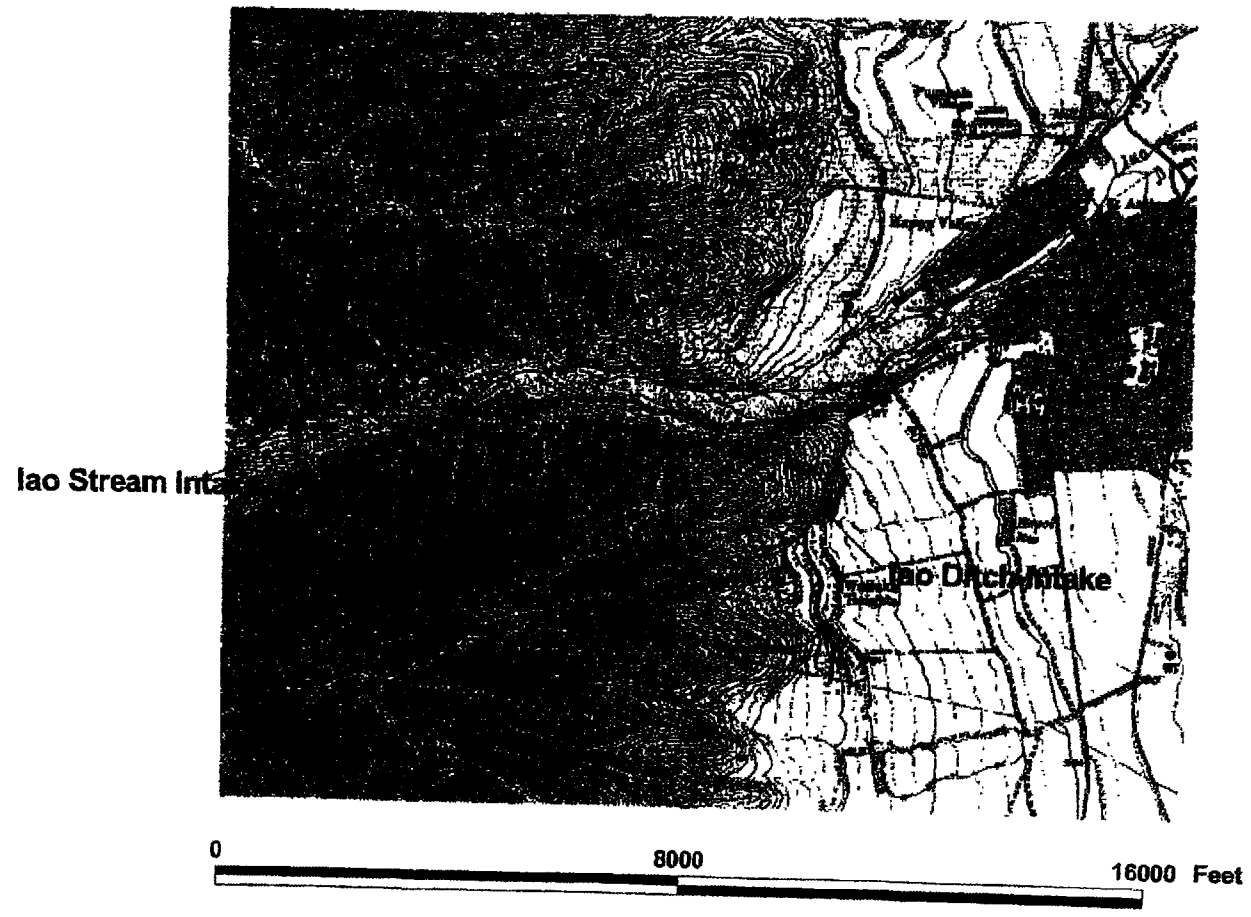
2. Explain how your proposed new use(s) will not interfere with any existing legal use(s).

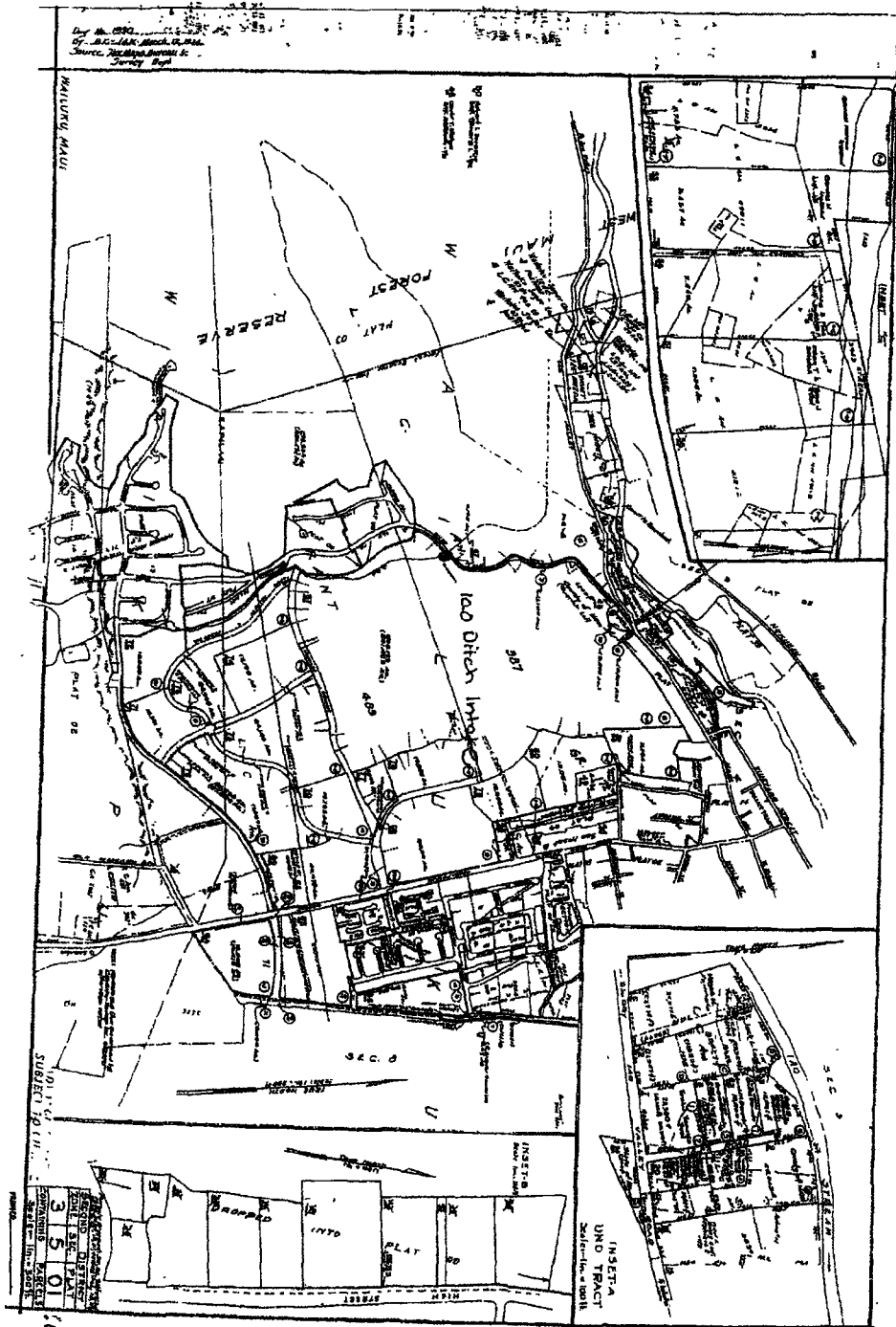
3. Explain how your proposed new use(s) will not interfere with the rights of the Department of Hawaiian Home Lands as provided in Section 221 of the Hawaiian Homes Commission Act. See below. To inquire about potential interference, you may contact the Department of Hawaiian Home Lands Planning Office at 586-3836.

The State Water Code in §174C-101(a), HRS [Native Hawaiian water rights], states: *Provisions of this chapter shall not be construed to amend or modify rights or entitlements to water as provided for by the Hawaiian Homes Commission Act, 1920, as amended, and by chapters 167 and 168, relating to the Molokai irrigation system. Decisions of the commission on water resource management relating to the planning for, regulation, management, and conservation of water resources in the State shall, to the extent applicable and consistent with other legal requirements and authority, incorporate and protect adequate reserves of water for current and foreseeable development and use of Hawaiian home lands as set forth in section 221 of the Hawaiian Homes Commission Act.*

Exhibit 1

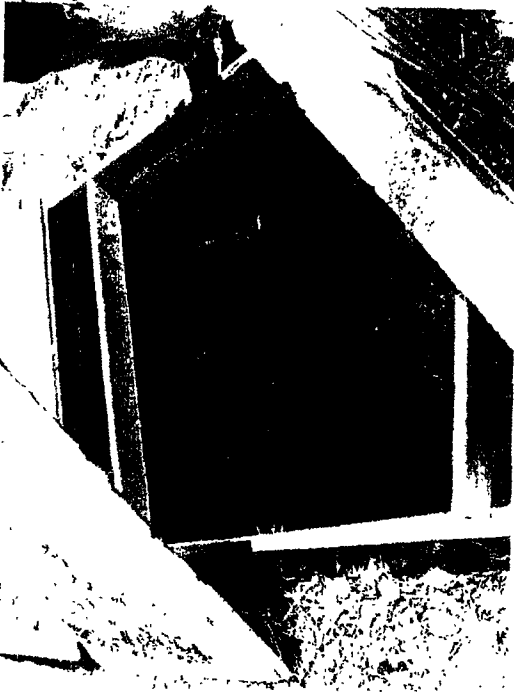
## Iao Ditch, Wailuku, Maui, Hawaii





[illegible]

Lao Ditch Intake



Lao Ditch Intake Improvements

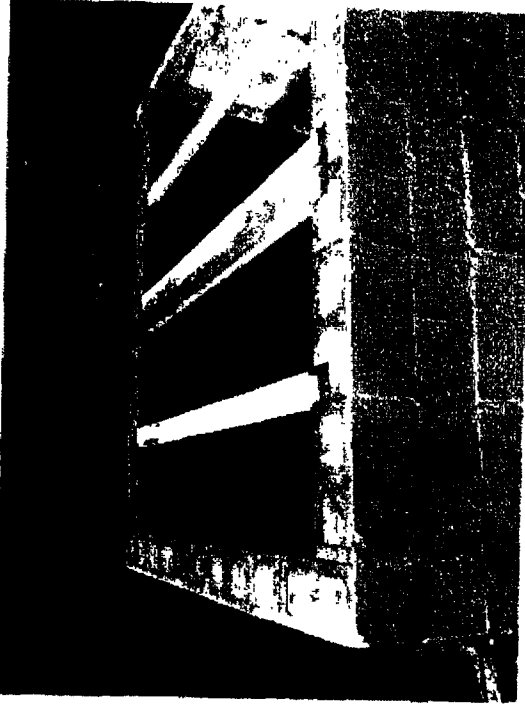
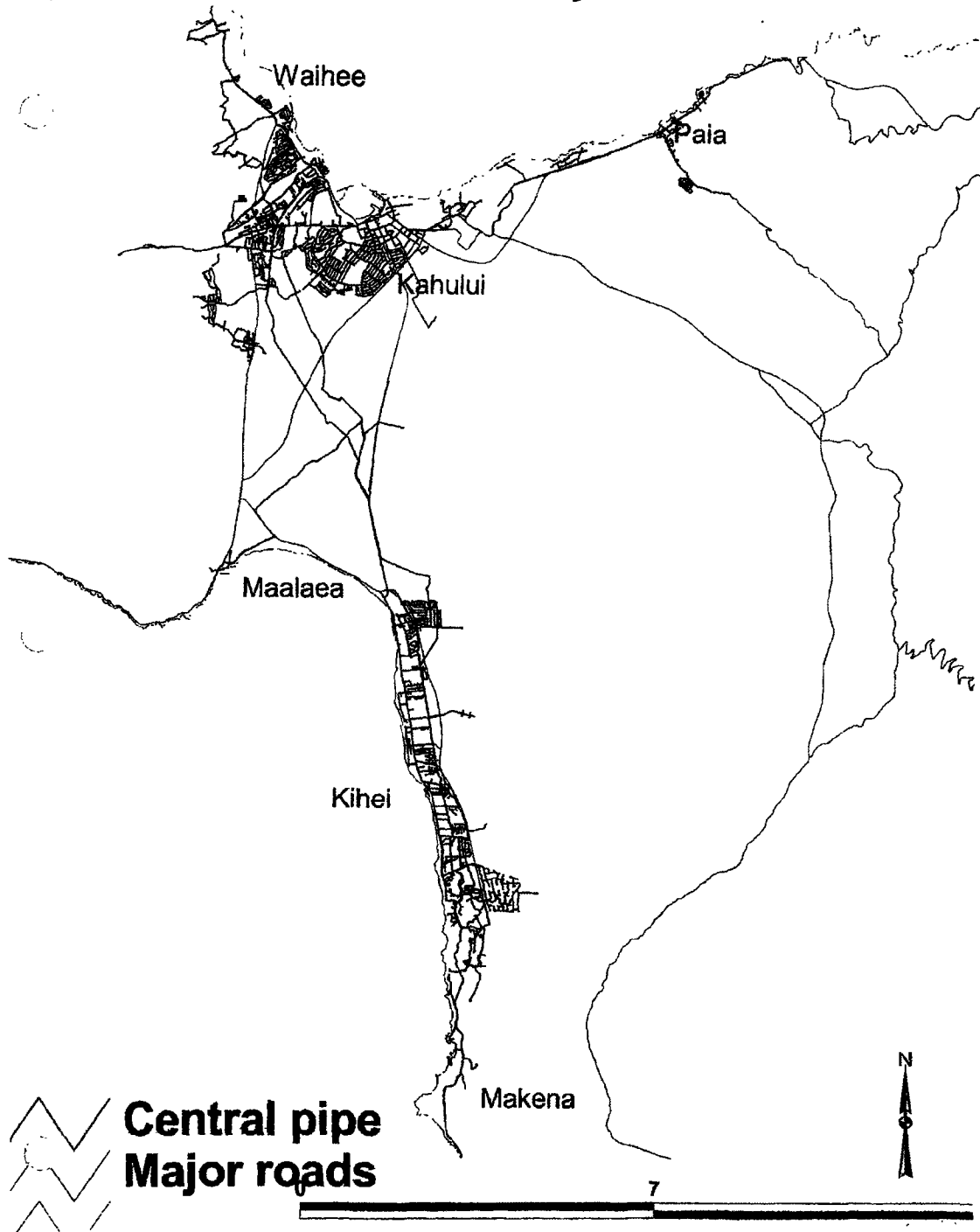


Exhibit 3

Lao Stream Diversion



# EXHIBIT 4 : Central Maui System Service Area



LINDA LINGLE  
GOVERNOR OF HAWAII



RECEIVED

2009 APR 27 AM 7:54

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

0409055-  
042709

LAURA H. THIELEN  
CHAIRPERSON

MEREDITH J. CHING  
JAMES A. FRAZIER  
NEAL S. FUJIWARA  
CHYOME L. FUKINO, M.D.  
DONNA FAY K. KYOSAKI, P.E.  
LAWRENCE H. MIKE, M.D., J.D.

KEN C. KAWAHARA, P.E.  
DEPUTY DIRECTOR

April 23, 2009

Ref.: SWUP.2178.6

Mr. Jeffrey Eng, Director  
Maui County Department of Water Supply  
200 South High Street  
Wailuku, HI 96793

Dear Mr. Eng:

Application for Surface Water Use Permit – Existing Use  
Iao-Waikapu Ditch, Iao Stream  
Na Wai Eha Surface Water Management Areas, Maui

We acknowledge receipt of your surface water use permit application for existing uses from the Iao-Waikapu Ditch in the Na Wai Eha Surface Water Management Areas on April 3, 2009. It was determined that your application was complete on April 16, 2009, after the Commission on Water Resource Management (Commission) adopted a Declaratory Ruling that Hawaii Revised Statutes Section 174C-51(1)(B) does not apply, that is, the source landowner's signature is not required, for surface water use permit applications for the Na Wai Eha Surface Water Management Areas, as long as the interests of the applicants are not as lessees, licensees, developers, or any other persons with a terminable interest or estate in the land which is the water source of the permitted water. You can expect your application to be processed within ninety (90) days from the date the Commission determined that your application was complete unless there are objections to your application.

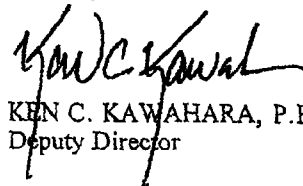
Enclosed is a copy of the public notice for your water use permit application which will be published in the Maui News issues of April 27, 2009 and May 4, 2009. You will be required to pay for the cost of the public notice, which runs about \$600. We will send you an invoice shortly after your notice is published.

Please be aware that there may be objections to your application. If objections are made, the objector is required to file such objections with the Commission and is also required to send you a copy of the objections.

You, or any other party, may respond to objections by filing a brief in support of your application with the Commission within ten (10) days of the filing of an objection. You, or the other party, must also send a copy of the response to the objector.

If you have any questions, please contact Robert Chong at (808) 587-0266, or toll free from Maui at 984-2400, extension 70266.

Sincerely,

  
KEN C. KAWAHARA, P.E.  
Deputy Director

Enclosure

c Jane Lovell, County of Maui

## PUBLIC NOTICE

### Applications for Surface Water Use Permits – Existing Uses Na Wai Eha Surface Water Management Areas (Waihee, Waiehu, Iao and Waikapu Streams) Maui

The following applications for surface water use permits for existing uses have been received by the Commission on Water Resource Management and are hereby made public in accordance with Section 13-171, Hawaii Administrative Rules, "Designation and Regulation of Water Management Areas."

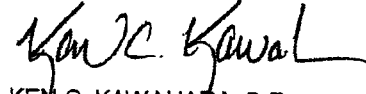
Applicant: Maui County Department of Water Supply  
200 South High Street  
Wailuku, HI 96793  
Date Application Acknowledged as Complete: April 16, 2009  
Source Hydrologic Unit: Iao Hydrologic Unit  
Quantity Requested: 1,365,250 gallons per day  
Existing Use of the Water: Municipal water supply  
Place of Water Use: Maui County DWS Central Maui Service System  
Location of the Diversion: TMK: (2) 3-5-001:067

Applicant: Kihei Garden & Landscaping Company, LLP  
P.O. Box 1058  
Puunene, HI 96784  
Date Application Acknowledged as Complete: April 16, 2009  
Source Hydrologic Unit: Iao Hydrologic Unit  
Quantity Requested: 33,261 gallons per day  
Existing Use of the Water: Irrigation of tropical landscape plants  
Place of Water Use: TMK: (2) 3-5-002:017  
Location of the Diversion: TMK: (2) 3-5-002:003

Applicant: David Niehaus  
1630 Piiloholo Road  
Makawao, HI 96768  
Date Application Acknowledged as Complete: April 16, 2009  
Source Hydrologic Unit: Waikapu Hydrologic Unit  
Quantity Requested: 48,000 gallons per day  
Existing Use of the Water: Taro cultivation and reforestation of native trees  
Place of Water Use: TMK: (2) 3-5-002:007  
Location of the Diversion: TMK: (2) 3-5-003:001 (Everett Ditch Intake)

Written objections or comments on the above applications may be filed by any person who has property interest in any land within the hydrologic unit of the source of water supply, any person who will be directly and immediately affected by the existing water use, or any other interested person. Written objections shall: (1) state property or other interest in the matter (provide TMK information); (2) set forth questions of procedure, fact, law, or policy, to which objections are taken; and (3) state all grounds for objections to the proposed permit. Written objections must be received by **May 18, 2009**. Objections must be sent to: 1) the Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809 and 2) the applicant(s) at the above address(es).

COMMISSION ON WATER RESOURCE MANAGEMENT

  
KEN C. KAWAHARA, P.E.  
Deputy Director

Dated: April 20, 2009

Publish in: Maui News issues of April 27, 2009, and May 4, 2009.

## Chapter 1: Population



*Canoe launch, Kahului.*

**P**opulation change on the island is inevitable. In-migration and out-migration occur at different rates and for different reasons. Understanding that our overall population will likely follow recent upward trends, it is our responsibility to decide how we would like this growth to manifest itself. Population growth can have positive and negative impacts on the environment, socio-economic and cultural composition of the island, and visitor experience. Visitors and new residents may arrive to Maui with expectations and values that conflict with the local way of life, a lifestyle that has been rooted on Maui for generations.

## POPULATION

The policies that are adopted to address the impacts of population change will ultimately define our expectations for the future, and are far more important than the population change itself.

### Background Information

The 2030 Socio-Economic Forecast is a planning tool; it identifies future options for the community to consider. The community may want to adopt policies to achieve a specific outcome that differs from the forecasted outcome, and to minimize the undesirable impacts of current trends. The population projections are based on trends and model assumptions that are absent of policy changes or directives. The forecast affects both ongoing planning (project review and approval) and the desired future articulated by Maui's residents and political leaders (General Plan and Community Plans). Because a long-term forecast identifies long-term trends and omits short-term variations, there will be many surprises along the way, even if a forecast turns out to be highly accurate.

The forecast was based on projections developed by the State of Hawai'i Department of Business, Economic Development & Tourism (DBEDT). The forecast allocates expected countywide change to local areas. The DBEDT long-term econometric model draws on historical data over three decades, plus projections from DBEDT and national sources. The DBEDT model (and accordingly, the allocation model) is economically driven: industries that attract capital are taken as crucial to economic growth, which in turn leads to new jobs and increased population.

### Historic Population Trends

To put population increase into perspective, it is appropriate to compare Maui Island's population increase to the other major islands in the Hawaiian chain throughout the recent past. It is evident from Table 1-1 (below) that while O'ahu experienced the most dramatic population increase during the 1950s, the other islands, including Maui, were impacted by the steepest increase in population between 1970 and 1990.

**Table 1 - 1: State and Island Population 1960 - 2010**

| Area              | 1960    | 1970    | 1980    | 1990      | 2000      | 2010      |
|-------------------|---------|---------|---------|-----------|-----------|-----------|
| State of Hawai'i  | 632,772 | 769,913 | 968,500 | 1,113,491 | 1,213,519 | 1,363,621 |
| Island of O'ahu   | 500,409 | 630,528 | 764,600 | 838,534   | 876,156   | 953,207   |
| Island of Hawai'i | 61,332  | 63,468  | 92,900  | 121,572   | 149,244   | 185,406   |
| Island of Maui    | 35,717  | 38,691  | 62,823  | 91,361    | 117,644   | 144,444   |
| Island of Kaua'i  | 27,922  | 29,524  | 39,400  | 51,676    | 58,568    | 67,226    |

*United States Census.*

According to the 2030 Socio-Economic Forecast, the total population is not expected to increase equally throughout the island; rather, there are specific regions where population growth is more likely to occur at a higher rate than others.

**Table 1 - 2: Community Plan Area Population 2000 – 2030**

| Community Plan Area   | 2000    | 2005    | 2010    | 2015    | 2020    | 2025    | 2030    |
|-----------------------|---------|---------|---------|---------|---------|---------|---------|
| West Maui             | 17,967  | 19,852  | 22,156  | 29,103  | 31,410  | 33,743  | 36,058  |
| Kihei-Mākena          | 22,870  | 25,609  | 27,244  | 37,850  | 40,850  | 43,885  | 46,896  |
| Wailuku-Kahului       | 41,503  | 46,626  | 54,433  | 52,343  | 56,492  | 60,689  | 64,853  |
| Makawao-Pukalani-Kula | 21,571  | 23,176  | 25,198  | 23,919  | 25,815  | 27,732  | 29,635  |
| Pā'ia-Ha'ikū          | 11,866  | 12,210  | 13,122  | 11,332  | 12,230  | 13,139  | 14,040  |
| Hāna                  | 1,867   | 1,998   | 2,291   | 2,541   | 2,743   | 2,947   | 3,149   |
| Total Maui Island     | 117,644 | 129,471 | 144,444 | 157,087 | 169,540 | 182,135 | 194,630 |

*State of Hawai'i Department of Business,*

*Economic*

*Development & Tourism.*

## POPULATION

U.S. Census Bureau, 2000; Socio-Economic Forecast, Maui County Department of Planning, 2006, revised 2012.

### **Demographic Conditions, Trends, and Projections**

Some demographic trends embedded in the forecast are consistent with the current projections.

- Between 2010 and 2030, the island's resident population is expected to grow from 144,444 to 194,630, an increase of 35 percent.
- The island's resident population is expected to grow at nearly an identical rate as the *de facto* population.
- The population is aging; the median age increased from 34.1 to 36.2 years between 1990 and 2000.
- Households are becoming smaller over time; Maui's household size is projected to decline from 2.94 persons per household in 2000 to 2.66 persons per household in 2030.

### **Economic Factors**

- Wage and salary jobs are expected to increase by about 1.1 percent annually.
- *Per capita* income will increase very little (in constant dollars).
- Visitor counts will increase by about 1 percent annually.
- Because of high occupancy rates, construction of new units is expected to resume, and the supply of visitor units is expected to grow at 1 percent annually.
- The past rate of growth in resident population, housing, and jobs is higher than the rate of visitor growth. This indicates that Maui's economy has diversified and is less driven by tourism than in the past.

### **Community Plan Area Findings**

To project future employment and housing needs for the island's Community Plan Areas, the forecast model allocated households based on historic trends, availability of entitled lands for development or redevelopment, development constraints, and careful consideration of planned and proposed development projects. The forecast model recognized that relatively isolated areas – such as Hāna – depend much more on the success of one major employer than do others; therefore, an economic downturn can have a devastating impact. Map 1-1 depicts Maui's major employment and population centers. For planning purposes, it is important to provide resident housing near employment.

| <b>Community Plan Area</b> | <b>Characteristics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>West Maui</b>           | In the 1990s, this area saw significant population and job growth. Looking to the future, these trends are projected to continue through 2030. Local development potential to monitor includes timeshare, large master-planned communities, and Hawaiian Homelands. Timeshares and other transient vacation rentals are of particular interest for the impact they may have on island-wide job distribution. Timeshares have higher occupancies than hotels, but employ fewer workers at the lodging site. |
| <b>Kihei-Mākena</b>        | This area has seen growth in the visitor industry, the technology sector, and expanding residential areas. It has had the smallest average household size, and anecdotally, its workforce is more transient than other areas. The forecast extends all these trends. Based in part on recent development proposals, the forecast shows stronger growth in residential units than in visitor units.                                                                                                         |

## POPULATION

| Community Plan Area   | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wailuku-Kahului       | This area remains the economic and population center of the island. In the 1990s, this area saw significant increases in trade, transportation, communications and utilities, and government jobs. Kahului Harbor is the port through which most cruise ship visitors reach Maui. The 2030 Socio-Economic Forecast suggests the Wailuku-Kahului Community Plan Area will grow faster than other parts of Maui, as former sugar lands are developed into residential subdivisions. Wailuku-Kahului is expected to maintain its status as home to more than a third of Maui's households. |
| Makawao-Pukalani-Kula | This area saw significant increases in population in the 1980s, but less growth subsequently. New development slowed because of water supply problems. Job growth occurred at a much faster rate, but the forecast calls for economic growth to continue at a slower pace. With only 1 job located in this area for every 2.5 households, most of the area's residents commute outside the area for work. This will continue to be the case; by 2030, the forecast shows only 2.1 local jobs per household.                                                                             |
| Pā'ia-Ha'ikū          | Since windsurfing became popular in the 1980s, this area has taken on new importance as the home of this sport. In the 1990s, upland regions saw new development of homes on large agricultural lots, with the area population increasing by 52 percent. In light of limited availability of suitable land for new homes, the forecast calls for much slower growth in housing and population.                                                                                                                                                                                          |
| Hāna                  | In recent years, this area has seen job losses and a decrease of children and young adults. Slow growth is projected over the planning period, provided the visitor economy remains healthy. Hāna has experienced new population resulting from in-migration.                                                                                                                                                                                                                                                                                                                           |

### CHALLENGES AND OPPORTUNITIES

The growth of Maui's resident and visitor population will create both challenges and opportunities. Population growth can exacerbate existing infrastructure-capacity deficiencies, place additional demands on environmental resources, foster shifts in the cultural and ethnic makeup of the population, and change the landscape. In addition, the loss of cultural identity and diversity has created social tensions that have increased over at least the last 20 years. The cultural understanding and sensitivity of new residents to the host culture has been a constant point of discussion throughout the MIP's public-engagement process.

#### Population Growth

Population growth can also contribute to the health of the community. Population growth is often necessary to maintain a growing economy, an expanding tax base, and employment opportunities. A host of negative social and economic conditions, such as unemployment, crime, family disintegration, and substance abuse, can be found in communities with longstanding population loss. Policies and actions to address population growth on Maui can be found throughout the MIP. Figure 1-1 depicts the projected growth in Maui's resident and *de facto* population to 2030.

Maui's population is aging; and recent data shows that trends related to Maui's aging population will be similar to the trends on the Mainland. Figure 1-2 portrays Maui's age distribution over time. This demographic change has significant impacts to public services as they relate to the elderly, including housing, transportation, health care, and elder care services.

## POPULATION

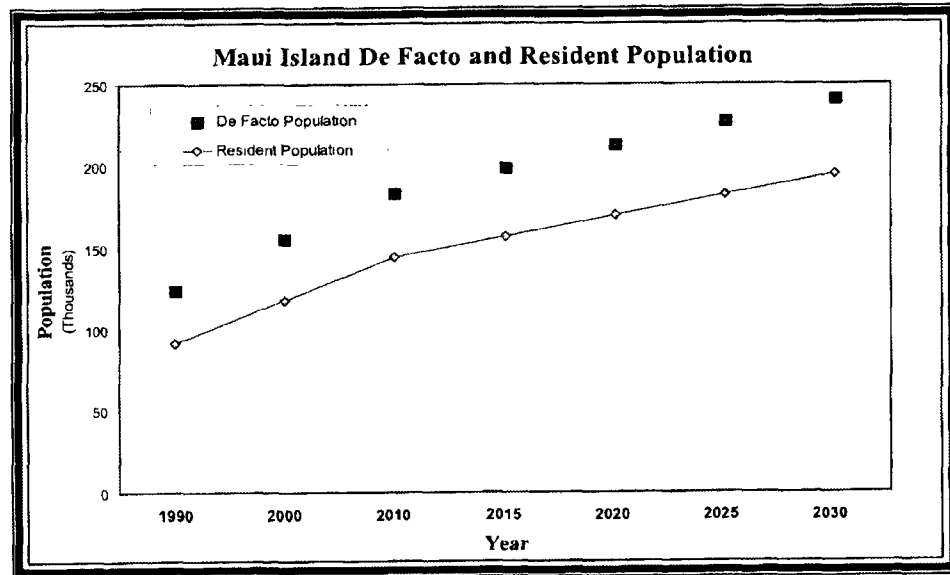


Figure 1 - 1. Maui Island Resident and De Facto Population Projections 1990 – 2030<sup>1</sup>

### Aging Population

In addition to the challenge of providing more senior services, the wage-earning population that typically supports children and seniors will be proportionally smaller. Policies and actions to address the aging population can be found in this chapter as well as the Housing, Economic Development, Land Use, and Infrastructure and Public Facilities chapters.

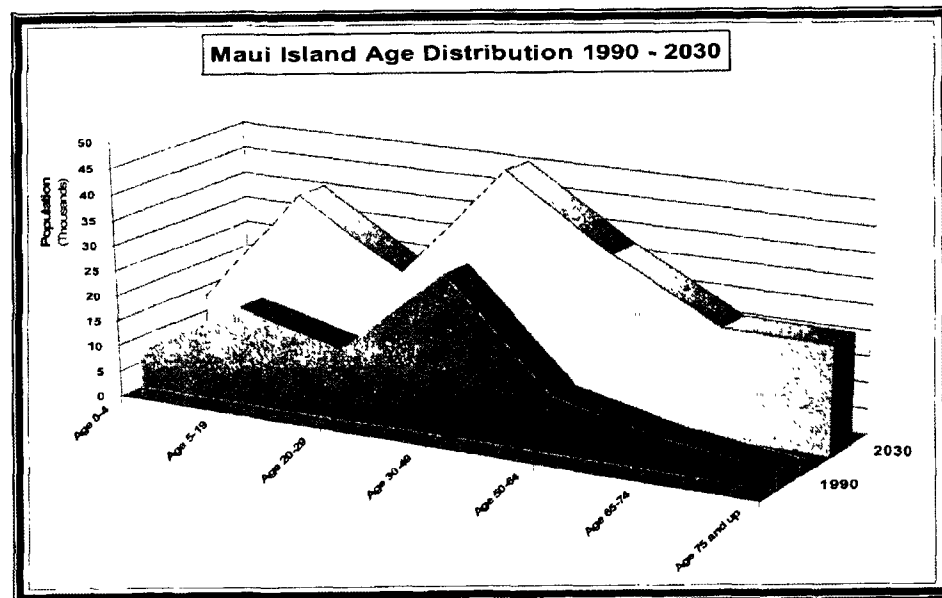


Figure 1 - 2. Maui Island Age Distribution 1990 – 2030.<sup>2</sup>

<sup>1</sup> Department of Business, Economic Development and Tourism, State of Hawai'i (2012). Population and Economic Projections for the State of Hawai'i to 2040 (March 2012).

## POPULATION

Figure 1-3 compares the percentage of Mauians born in Hawai'i to the percentage born elsewhere. The percentage of those born in Hawai'i has dropped from 67 percent in 1980 to 53 percent in 2000. The out-migration of island residents is a result of Maui's high cost of housing, limited employment and educational opportunities, and the desire of some Maui residents to experience life outside of Hawai'i. Policies and actions to help provide a choice for island residents to remain on Maui can be found throughout the MIP.

### *Out-migration of Island Residents*

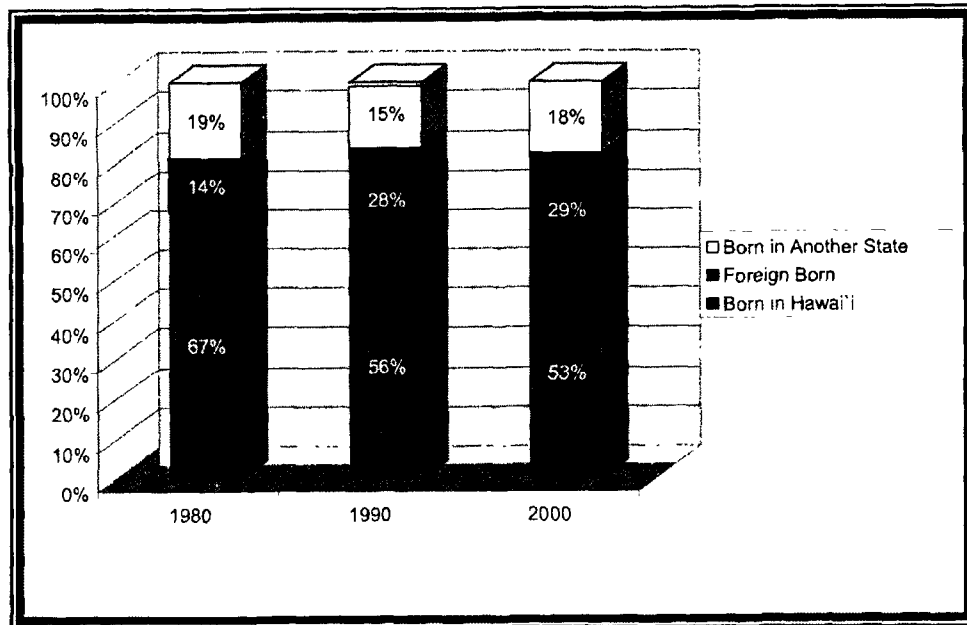


Figure 1 - 3. Maui Island Residents by Place of Birth 1980 – 2000. (Source: United States Census)

### *Ratio of Visitors to Residents*

Figure 1-4 graphically depicts visitor/resident population trends from 1970 to the projection year of 2030. In 1970, the ratio of tourists to residents was approximately 1 to 20. This number has risen dramatically; by 2000, the ratio was approximately 1 to 3.

<sup>2</sup> Department of Business, Economic Development and Tourism, State of Hawai'i (2012). Population and Economic Projections for the State of Hawai'i to 2040 (March 2012)

## POPULATION

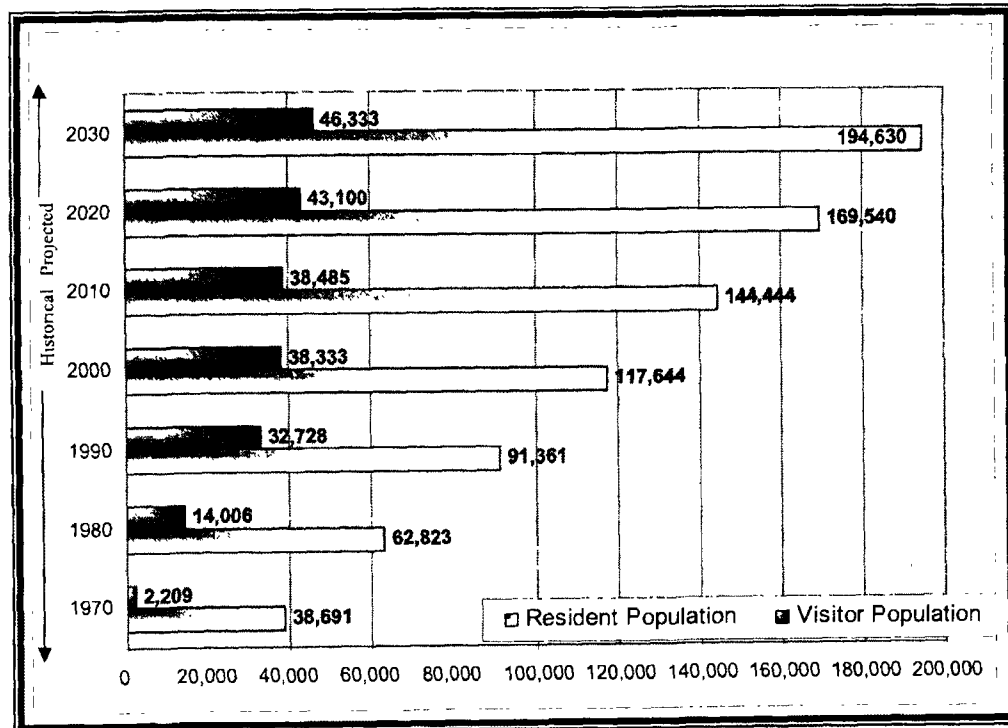


Figure 1 - 4. Maui Island Visitor/Resident Population 1970 – 2030<sup>3</sup>.

### GOAL, OBJECTIVES, POLICIES, AND ACTIONS

#### Goal:

- 1.1 Maui's people, values, and lifestyles thrive through strong, healthy, and vibrant island communities.

#### Objective:

- 1.1.1 Greater retention and return of island residents by providing viable work, education, and lifestyle options.

#### Policies:

- 1.1.1.a Expand programs that enable the community to meet the education, employment, housing, and social goals of youth and young adults.

<sup>3</sup> Population and Economic Projections for the State of Hawai'i to 2040 (March 2012).

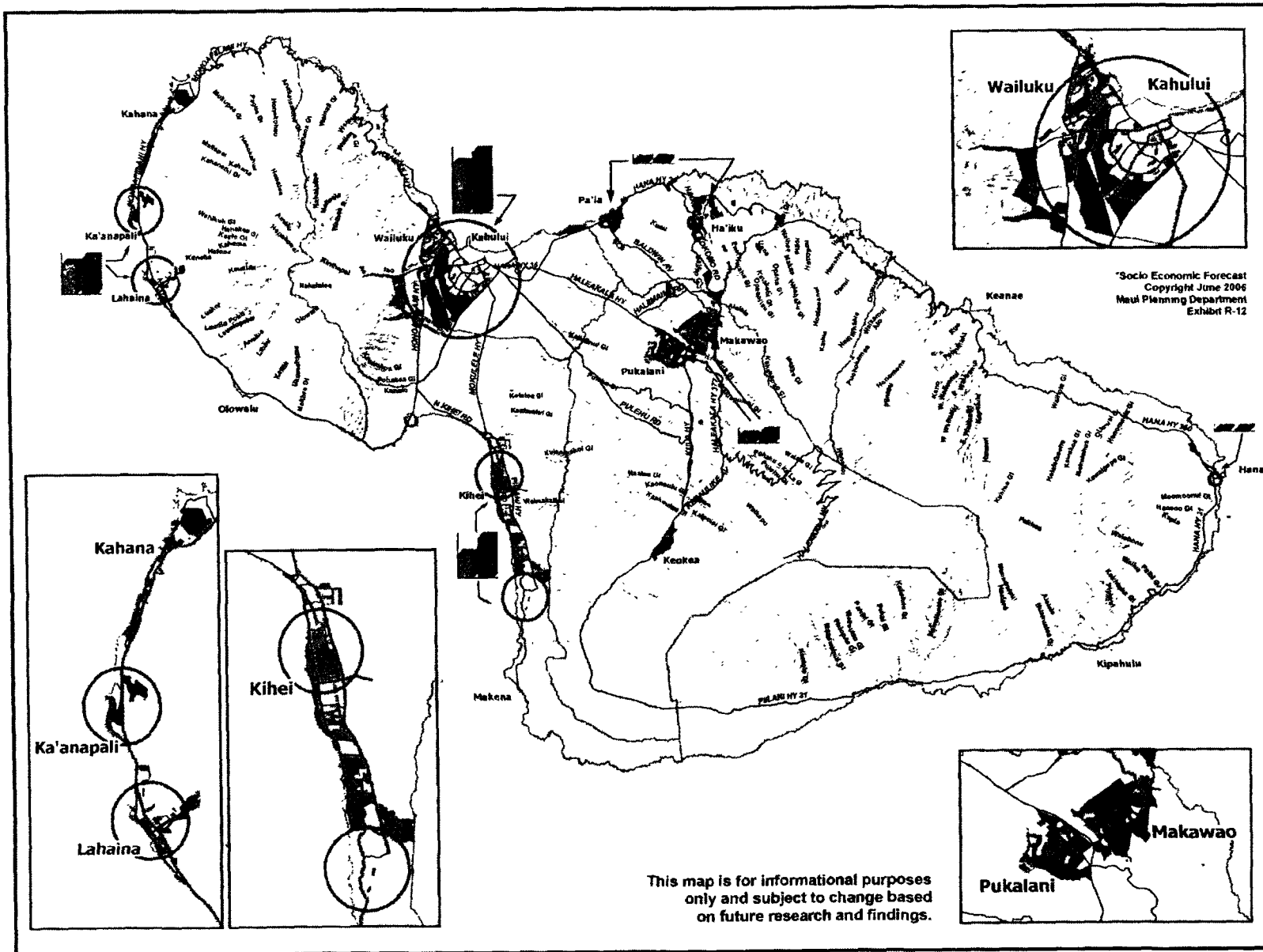
## POPULATION

---

- 1.1.1.b** Expand housing, transportation, employment, and social opportunities to ensure residents are able to comfortably age within their communities.
- 1.1.1.c** Measure and track resident satisfaction through surveys and community indicators.
- 1.1.1.d** Support funding for transportation, housing, health care, recreation, and social service programs that help those with special needs (including the elderly and disabled).

### **Implementing Actions:**

- 1.1.1-Action 1** Use an existing agency to facilitate education, employment, housing, social services, and other programs that help retain young adults on Maui.
- 1.1.1-Action 2** Identify existing and develop new funding sources for youth and family services (e.g., recreation, health care, education, housing, child care, etc.) and integrate such resources to achieve an effective outcome.
- 1.1.1-Action 3** Develop and regularly conduct a Community Satisfaction Survey to measure residents' quality-of-life, facilitate the development of informed policies/programs, and improve service delivery.



## Employment & Population Density Map

Island of Maui

**Background Map**  
For Informational Purposes Only

### Legend

- Primary Road
- Stream
- Regional Economic Center
- Community Plan Boundary
- Topography - 100 ft contour
- Jobs by Community Plan Areas\*

- Jobs 2005  
Jobs 2030
- Population Density**  
Per Acre by Census Block
- |            |
|------------|
| 0.0 - 1    |
| 1.1 - 5    |
| 5.1 - 10   |
| 10.1 - 15  |
| 15.1 - 20  |
| 20.1 - 25  |
| 25.1 - 30  |
| 30.1 - 50  |
| 50.1 - 80  |
| 80.1 - 150 |



Product Code: M-ET-21206201  
Copyright © September 20, 2012  
Hawaii Department of Planning  
280 South High Street  
Honolulu, Hawaii 96813

Prepared by:  
Long Range Planning Division  
Department of Planning  
County of Maui  
280 South High Street  
Wailuku, Hawaii 96793

**Map 1-1**



COPY

**AGREEMENT CONCERNING WITHDRAWAL FROM THE IAO/WAIKAPU DITCH**

85.575 prn

## TABLE OF CONTENTS

|                                                                                                                |   |
|----------------------------------------------------------------------------------------------------------------|---|
| 1. <u>Term</u> .....                                                                                           | 1 |
| 2. <u>Water</u> .....                                                                                          | 1 |
| 3. <u>Charges</u> .....                                                                                        | 2 |
| 4. <u>License by Wailuku to DWS</u> .....                                                                      | 3 |
| 5. <u>No Third Party Beneficiaries</u> .....                                                                   | 3 |
| 6. <u>Operation of the Micro-Filtration Unit</u> .....                                                         | 3 |
| 7. <u>Indemnification With Respect to the Use and Quality/Quantity Water</u> .....                             | 3 |
| 8. <u>Indemnification With Respect to Use of<br/>Premises and Operation of the Micro-Filtration Unit</u> ..... | 3 |
| 9. <u>Acceptance of Water Delivered</u> .....                                                                  | 4 |
| 10. <u>Action by State of Hawaii Commission on Water Resource Management</u> .....                             | 4 |
| 11. <u>Risk of Loss</u> .....                                                                                  | 4 |
| 12. <u>Public Utility</u> .....                                                                                | 4 |
| 13. <u>Assignment</u> .....                                                                                    | 4 |
| 14. <u>Permits</u> .....                                                                                       | 5 |
| 15. <u>Government Regulations</u> .....                                                                        | 5 |
| 16. <u>Condemnation</u> .....                                                                                  | 5 |
| 17. <u>Condition of Premises/Assumption of Risk</u> .....                                                      | 5 |
| 18. <u>No Liens</u> .....                                                                                      | 5 |
| 19. <u>Hazardous Substances</u> .....                                                                          | 6 |
| 20. <u>Shutdown of Ditch</u> .....                                                                             | 6 |
| 21. <u>Force Majeure</u> .....                                                                                 | 7 |
| 22. <u>Termination of Agreement</u> .....                                                                      | 7 |

|                                          |   |
|------------------------------------------|---|
| 23. <u>Power and Authority</u> .....     | 7 |
| 24. <u>Independent Contractors</u> ..... | 7 |
| 25. <u>Notices</u> .....                 | 7 |
| 26. <u>Counterparts</u> .....            | 9 |
| 27. <u>Facsimile</u> .....               | 9 |

AGREEMENT CONCERNING WITHDRAWAL  
FROM THE IAO/WAIKAPU DITCH

THIS AGREEMENT, made and entered into this 9<sup>th</sup> day of June, 2004, by and among WAILUKU AGRIBUSINESS CO., INC., a Hawaii corporation, whose mailing address is 255 East Waiko Road, Wailuku, Hawaii 96793, referred to as "Wailuku", and the COUNTY OF MAUI, through its DEPARTMENT OF WATER SUPPLY, whose principal place of business and mailing address is 200 South High Street, Wailuku, Hawaii 96793, referred to as "DWS".

WITNESSETH:

WHEREAS, on December 1, 2002, the Board of Water Supply of the County of Maui entered into an agreement with Alexander & Baldwin, Inc., Hawaii Commercial and Sugar Company, Inc., Wailuku Agribusiness Co., Inc., pursuant to which the Department of Water Supply has had the ability to withdraw from the Iao/Waikapu Ditch up to 1,500,000 gallons of water per 24 hour period;

WHEREAS, the December 1, 2002 Agreement between Board of Water Supply and the referenced parties will terminate on November 30, 2004;

WHEREAS, DWS has requested Wailuku to permit DWS to continue to withdraw surface water from the Iao/Waikapu Ditch for the purpose of easing the demand on the Iao Aquifer ground water resources; and

WHEREAS, such water currently is being used by Wailuku; and

WHEREAS, Wailuku is willing to provide such water in order to accommodate DWS;

NOW, THEREFORE, IN CONSIDERATION of mutual promises and agreements of the parties, the parties hereto agree as follows:

1. Term. The term of this Agreement shall be three years, beginning December 1, 2004 and ending November 30, 2007.
2. Water. From the water collected by Wailuku in the Iao/Waikapu Ditch system, Wailuku shall make available to DWS, at the location along the Iao/Waikapu Ditch, as identified in Exhibit "A", attached hereto and incorporated herein by reference (the "Delivery Point"), which location is downstream (but not within 25 feet) of the existing Iao/Waikapu Ditch gauging station, up to Three Million Two Hundred Thousand (3,200,000) gallons of water per twenty-four hour period; provided, however, that, as soon as possible upon notice from Wailuku or its authorized representative that the flow in Iao Stream is below 11.5 million gallons of water for the immediately-prior twenty-four hour period, as measured by the U. S.

Geological Survey gauging station located at Iao Stream at Kepaniwai Park near Wailuku. DWS shall cease all withdrawal hereunder from Iao/Waikapu Ditch for so long as the Iao Stream flow remains below 11.5 million gallons of water per twenty-four hour period. As soon as possible, Wailuku will provide written notice to DWS when the flow in Iao Stream exceeds 11.5 million gallons for a 24 hour period, such that DWS may then continue its withdrawal of water, as authorized hereunder.

The net amount of water withdrawn from the Iao/Waikapu Ditch shall be calculated by DWS from the three meters<sup>1</sup> installed and maintained by DWS, at its sole expense; said meters are located immediately after DWS' intake from the Iao/Waikapu Ditch immediately before DWS' micro-filtration unit, between the micro-filtration unit and the DWS storage tank. DWS shall provide continuous access to Wailuku to the three DWS meters in order for Wailuku to verify the meter readings. DWS shall maintain the meters within two percent (2%) accuracy and test them on a reasonable periodic basis (at least quarterly) and provide such testing results to Wailuku immediately after obtaining such testing results.

3. Charges. In return for the access granted by Wailuku to DWS to Wailuku's water system and for providing the withdrawal of up to 3,200,000 gallons of water available to DWS, for said 24 hour period, DWS shall pay to Wailuku a fixed transportation fee of \$0.48 per thousand gallons delivered. The gallons delivered shall not include water used for back washing, as long as such back washing water is placed back into Wailuku's water system. DWS shall pay the fee, plus the applicable general excise tax on the same. It is the intent of Wailuku and DWS that DWS shall pay for the actual net amount of water withdrawn from the Iao Waikapu Ditch (excluding water used for back washing filters and returned to the Iao/Waikapu Ditch and/or the Waihee Ditch).

Commencing on December 1, 2004, or earlier, as otherwise agreed to by the parties in writing, DWS shall pay the foregoing fees to Wailuku on a monthly basis. The payment shall be made by DWS to Wailuku on or before the 10th day of the month following the month in which the water is withdrawn. Payment of the foregoing fees to Wailuku shall fully and completely satisfy the obligation of DWS for the payment of fees required under this section. Interest rate at 1% per month shall be applied to any late payments. Concurrent with the payment of the fees described in this

---

<sup>1</sup> The three meters installed and maintained by DWS include Meter 1 which is the meter from the ditch to the intake; Meter 2 which is the meter from the intake to the filter system; and Meter 3 is the meter from the filter to DWS' tank. The back wash which DWS will not be charged is the volume under Meter 1 (ditch to the intake) minus the volume under Meter 3 (the gallonage from the filter system to the distribution tank). The back wash shall not be charged to DWS as long as DWS places the back wash water to the Iao/Waikapu Ditch system and/or the Waihee Ditch system.

section, DWS shall provide Wailuku with a report disclosing its daily meter readings, from each of the DWS three meters for the month in question, as well as the computation of fees. DWS may avoid transportation fees with regard to water it withdraws from the Iao Waikapu Ditch during testing by returning such water (other than samples taken for testing) to the Iao/Waikapu Ditch or the Waihee Ditch. DWS shall document the taking of the water by testing and the return of the water to either the Iao Waikapu Ditch or the Waihee Ditch. Copies of all test reports shall be provided to Wailuku.

4. License by Wailuku to DWS. Wailuku hereby grants to DWS a license to enter into Wailuku lands identified on Exhibit "A" for the purposes of carrying out DWS' rights to withdraw water from the Iao/Waikapu Ditch under this Agreement. This license shall be coterminous with this Agreement and shall end on November 30, 2007, unless earlier terminated by Wailuku, as provided herein, including any breach by DWS.
5. No Third Party Beneficiaries. Nothing in this Agreement shall be construed as giving any person or entity, other than the parties hereto and their successors and assigns, any right, remedy or claim under or in respect to this Agreement or any provision hereof.
6. Operation of the Micro-Filtration Unit. DWS shall be solely responsible for the operation of its micro-filtration unit, as well as for the repair and maintenance of the unit and the electrical and other costs to operate the unit.
7. Indemnification With Respect to the Use and Quality/Quantity Water. To the extent permitted by law, DWS shall defend, indemnify and hold harmless Wailuku, its subsidiaries and affiliates, including its directors, officers, employees, agents, and representatives from and against any claim, damages or liability, suit or action brought against it (including all costs and expenses resulting therefrom, including reasonable attorney's fees) arising out of or in connection with the use and/or quality and/or quantity of water withdrawn by DWS from the Iao Waikapu Ditch pursuant to this Agreement, including without limitation, any claim for personal injury (or death) or loss of property based upon the use, quality or the quantity of such water withdrawn by DWS.
8. Indemnification With Respect to Use of Premises. To the extent permitted by law, DWS shall defend, indemnify and hold harmless Wailuku against any claim, suit or action, liability, damages incurred or suffered by Wailuku, including all costs and expenses resulting therefrom including reasonable attorney's fees, including without limitation a claim for personal injury or death, or loss of property arising out of or in connection with or based upon use by DWS of the property of Wailuku under this Agreement, including the occupancy by DWS, its employees, agents, contractors, licensees, assignees

of any of Wailuku's lands, whether leased or owned in fee by Wailuku, including but not limited to, roads, trails, the Delivery Point, or the Iao/Waikapu Ditch. To the extent permitted by law, DWS shall reimburse Wailuku for all of its costs and expenses, including reasonable attorneys' fees, incurred in connection with the defense of any such claims, suits or actions.

9. Acceptance of Water Delivered. DWS hereby represents that it accepts the delivery of water from Wailuku at the Delivery Point and the Iao/Waikapu Ditch in its "AS IS" condition.
10. Action by State of Hawaii Commission on Water Resource Management. If during the term of this Agreement the State of Hawaii Commission on Water Resource Management shall by the designation of the Iao/Waikapu Ditch, and/or by the adoption of an instream restoration plan, or other action, reduce the water available to Wailuku, then Wailuku shall have the option at its election, in its sole discretion by written notice to DWS, to terminate this Agreement or to reduce the water available to DWS under this Agreement.
11. Risk of Loss. DWS shall hold all equipment, machinery and other property whatsoever at the micro-filtration unit site and or upon any Wailuku property in connection with this Agreement at its sole risk, and shall save Wailuku harmless from any loss or damage thereto from any cause whatsoever.
12. Public Utility. Neither party shall attempt to have the Public Utilities Commission of the State of Hawaii (PUC) nor any other regulatory agency exercise any regulatory authority over any matter set forth in the Agreement. If the PUC or any other governmental regulatory agency should, exercise any regulatory authority over any matter set out in the Agreement, or seek to obtain regulatory authority over Wailuku, or the Iao/Waikapu Ditch (or any portion thereof) as a result of any matter set forth in the Agreement, or use this Agreement in any manner in support of its attempt so to obtain such regulatory authority, Wailuku may, in its sole discretion, by written notice to DWS, terminate immediately the Agreement, and shall be entitled to enforce such termination through any and all legal means available.
13. Assignment. DWS shall not, without the prior written consent of Wailuku, which consent shall be exercised in their absolute discretion, transfer, assign, mortgage, sublease, sublicense, or otherwise encumber, this Agreement or any portion thereof. No permitted assignment or other transfer of this Agreement or any portion thereof shall relieve DWS of any of its duties or obligations hereunder.

14. Permits. DWS shall obtain all governmental permits, approvals or the like at its sole expense, required for the uses, activities and operations, which are contemplated by this Agreement.
15. Government Regulations. DWS shall observe, perform and comply with all applicable government laws, ordinances, rules and regulations applicable to any of the matters set out in this Agreement. DWS shall observe and perform the terms and conditions of any government permit that it obtains under this Agreement.
16. Condemnation. If at any time any of the property utilized and enjoyed under this Agreement by DWS, including but not limited to, lands owned or controlled by Wailuku in fee or lease, roads and the Iao/Waikapu Ditch, or any portion thereof, are taken or condemned by any authority having the power of eminent domain, then and in every such case, all compensation and damages payable for or on account of any such property shall be paid to and be the property of Wailuku, as appropriate, without any apportionment thereof to DWS, provided that DWS shall be entitled to recover only from the condemning authority compensation and damages payable only for or on account of any improvements erected by DWS on such property and for any and all damage to DWS's business by reason of any condemnation as may be separately awarded. It is hereby expressly agreed that DWS has no estate or interest of any kind or nature whatsoever in such lands which are covered by this Agreement or in the Iao/Waikapu Ditch System. In the event that the condemning authority takes any such land or the Iao/Waikapu Ditch, or any portion thereof, so as to render the purpose of this Agreement impractical, in Wailuku's sole discretion, this Agreement shall terminate, and Wailuku, as applicable, shall be entitled to enforce such termination and condemnation recovery as provided for herein through any and all legal means available.
17. Condition of Premises/Assumption of Risk. DWS hereby agrees and acknowledges that Wailuku has not made or will not make any representations or warranties, implied or otherwise, with respect to the condition of the water and/or lands referred to in Section 2 of this Agreement or of the Iao/Waikapu Ditch, including but not limited to the Delivery Point, including any dangerous or defective conditions existing upon or with respect to such lands and/or to the Iao/Waikapu Ditch, whether or not such conditions are known to Wailuku or reasonably discoverable by DWS. DWS accepts each entry upon such lands and use of the Iao/Waikapu Ditch with full assumption of the risks and consequences of said conditions.
18. No Liens. DWS shall not commit or suffer any act or neglect whereby the land referred to in Section 2 of this Agreement, or the Iao/Waikapu Ditch, including any improvements thereon, or DWS's interest in the same at any time during the term of this Agreement, shall become subject to any attachment, lien, charge or encumbrance whatsoever, and, to the extent

permitted by law, shall indemnify and hold harmless Wailuku against all liens, charges and encumbrances and all expenses resulting therefrom, including reasonable attorney's fees.

19. Hazardous Substances. As used herein, the term "Hazardous Material" means any hazardous, infectious or toxic substances, material or waste so designated or described, presently or in the future, by any environmental law of the United States, the State of Hawaii, or the County of Maui, or so designated or described by any government agency authorized to enforce any such environmental law. DWS shall not cause or permit any Hazardous Material to be brought upon, kept or used at or about the properties which are referred to in Section 2 of this Agreement (which, for the purposes of this Section, are collectively referred to as the "Premises"). If the presence of Hazardous Material at the Premises caused or permitted by DWS results in the contamination of the Premises or the Iao/Waikapu Ditch by Hazardous Materials otherwise occurs for which DWS is liable to Wailuku for damages resulting therefrom, then, to the extent permitted by law, DWS shall indemnify and defend Wailuku from any and all resulting claims, judgments, damages, penalties, fines, costs and liabilities or losses (including without limitation, diminution in value of the Premises or the Iao/Waikapu Ditch, damage for the loss or restriction on use of any part of the Premises or the Iao/Waikapu Ditch, attorney's fees and expert fees). Such obligation of DWS to so indemnify Wailuku includes, without limitation, any liability incurred in connection with any investigation of site conditions or any clean-up, and any remedial, removal or restoration work required, because of any Hazardous Material being present in the soil or ground water on or under the Premises. Without limiting the foregoing, if the presence of any Hazardous Material at the Premises caused or permitted by DWS results in any contamination of the Premises or Iao/Waikapu Ditch, DWS shall promptly take all actions at its sole expense necessary to return the Premises or Iao/Waikapu Ditch to the condition existing prior to the introduction of any such Hazardous Material.
20. Shutdown of Ditch. Nothing in this Agreement shall be deemed to prevent Wailuku from shutting down all or part of the Iao/Waikapu Ditch system permanently or temporarily, as necessary or desirable in Wailuku's sole and absolute determination because of repair work being done to the Iao/Waikapu Ditch system, or because of operational or safety concerns, there being no representation, warranty or guaranty by this Agreement that Wailuku will continue to operate the Iao/Waikapu Ditch. In the event of a permanent shutdown, this Agreement shall be deemed terminated. If a shutdown is temporary, this Agreement shall be suspended for the duration of the shutdown.

21. Force Majeure. Wailuku shall not be responsible for any failure to make available the water that is the subject of this Agreement, if such failure arises out of or results from an event of force majeure including, without limitation, Act of God, strike or other labor trouble, national emergency, war, riot or other civil disturbance, sabotage, failures or delays in transportation, inability to secure raw materials, parts or supplies, rules, regulations, orders or directives of any governmental authority or the order of any court of competent jurisdiction, or any other cause, contingency or circumstance not subject to either of its reasonable control which prevents or hinders the availability of the water.
22. Termination of Agreement. Wailuku may terminate this Agreement in the event that DWS is in default under this Agreement by failing to observe or perform any or all of the covenants contained in the Agreement.
23. Power and Authority: Wailuku has the full power to consummate the transaction provided for in this Agreement. The execution and delivery of this Agreement by Wailuku has been duly and validly authorized by the necessary corporate action on the part of Wailuku and this Agreement constitutes the legal, valid and binding obligation of Wailuku.

DWS has the full power to consummate the transactions provided for in this Agreement. The execution and delivery of this Agreement by DWS and the consummation of the transactions herein have been duly and validly authorized by the necessary action on the part of DWS and this Agreement constitutes the legal, valid and binding obligation by DWS.

24. Independent Contractors. The parties understand and agree that each of them has entered upon this Agreement as an independent contractor. The parties do not intend to create a partnership or joint venture between or among them by this Agreement. The parties do not intend to create a principal and agent relationship between or among them by this Agreement. No party has any authority or power to act as the agent for or bind the other in respect to any matter whatsoever.
25. Notices. Any notice required or permitted to be given under this Agreement shall be in writing and shall be deemed to have been delivered when (i) personally delivered, (ii) sent by facsimile transmission, or (iii) sent by certified or registered mail, postage prepaid, return receipt requested, to the address or facsimile number as the party to whom notice is to be given may provide in a written notice to the other parties. Notice also shall be deemed to have been delivered when given pursuant to more expeditious means, such as telephone or e-mail, as mutually agreed upon by the parties. If such more expeditious means is by other than written means, subsequent written notice shall be delivered pursuant to (i), (ii) or (iii) above within twenty-four hours.

If to DWS: Department of Water Supply  
County of Maui  
200 South High Street  
Wailuku, Hawaii 96793  
Attn: Director, Department of Water Supply  
Facsimile No.: (808) 270-7951

or

Water Treatment Plant Operations Manager  
614 Palapala Drive  
Kahului, Hawaii 96732  
Facsimile No.: (808) \_\_\_\_\_

with copy to:

Department of the Corporation Counsel  
County of Maui  
200 South High Street  
Wailuku, Hawaii 96793  
Attn: Edward S. Kushi, Jr., Deputy Corporation Counsel  
Facsimile No.: (808) 270-7152

If to Wailuku: Wailuku Agribusiness Co., Inc.  
255 East Waiko Road  
Wailuku, Hawaii 96793  
Attn: Avery B. Chumbley  
Facsimile No.: (808) 242-7068

with copy to:

C. Brewer and Company, Limited  
P. O. Box 1826  
Papaikou, Hawaii 96781-1826  
Attn: General Counsel  
Facsimile No.: (808) 964-8426

and with copy to:

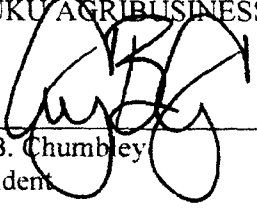
Mancini, Welch & Geiger, LLP  
33 Lono Avenue Suite 470  
Kahului, Hawaii 96732  
Attn: Paul R. Mancini  
Facsimile No.: (808) 871-0732

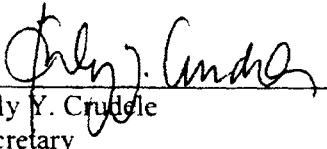
26. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed to be an original, but all of which shall constitute one and the same instrument.
27. Facsimile. Fax (facsimile) copies of this executed Agreement shall be fully binding and effective for all purposes whether or not original executed documents are transmitted to Escrow. Fax signatures on documents will be treated the same as original signatures. However, each party agrees that it will promptly forward originally executed agreements to each other.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed on the date first above written.

WAILUKU:

WAILUKU AGRIBUSINESS CO., INC.

  
Avery B. Chumbley  
Its President

  
Beverly Y. Crudde  
Its Secretary

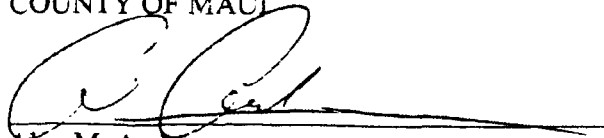
DWS:

COUNTY OF MAUI

\_\_\_\_\_  
Alan M. Arakawa  
Its Mayor

DWS:

COUNTY OF MAUI

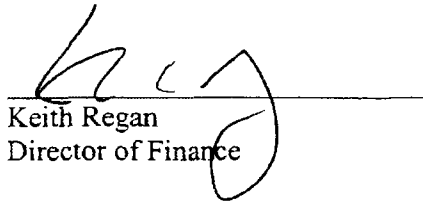


Alan M. Arakawa  
Its Mayor

**APPROVAL RECOMMENDED:**

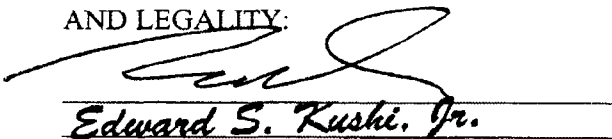


George Y. Tengan  
Director of Water Supply



Keith Regan  
Director of Finance

APPROVED AS TO FORM  
AND LEGALITY:



*Edward S. Kushi, Jr.*

(Please type or print name above)



Corporation Counsel  
County of Maui

STATE OF HAWAII )  
 ) SS.  
COUNTY OF HAWAII )

On this 19<sup>th</sup> day of May, 2004, before me appeared  
AVERY B. CHUMBLEY and BEVERLY Y. CRUDELE, to me personally known, who being  
by me duly sworn or affirmed, that they are the PRESIDENT and SECRETARY, respectively, of  
Wailuku Agribusiness Co., Inc., a Hawaii corporation, and that the foregoing instrument is the  
corporate seal of said corporation by authority of its Board of Directors, and said officers  
acknowledged said instrument to be free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Nora Rosario L.S.  
Name: Nora Rosario  
Notary Public, State of Hawaii

My commission expires: 12-13-2006

STATE OF HAWAII )

)SS.

COUNTY OF MAUI )

On this \_\_\_\_\_ day of JUN 9 2004, 2004, before me appeared ALAN M. ARAKAWA, to me personally known, who being by me duly sworn did say that he is the Mayor of the County of Maui, a political subdivision of the State of Hawaii, in the capacity shown, having been duly authorized to execute such instrument in such capacity, and that the seal affixed to the foregoing instrument is the lawful seal of the said County of Maui, and that the said instrument was signed and sealed in behalf of said County of Maui by authority of its Charter, and the said ALAN M. ARAKAWA acknowledged the said instrument to be the free act and deed of said :County of Maui.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

*Linda K. Ramondino*

Notary Public, State of Hawaii

Print Name: LINDA K. RAMONDINO

My commission expires: 10/19/06

15

Exhibit "A"

TMK 3-5-01:01 WAIWUKU AGRIBUSINESS CO INC.

IAO / WAIKAPU DITCH

APPROX 2,500 feet  
COUNTY OF MAUI  
DEPARTMENT OF WATER SUPPLY  
LICENSE USE AREA, IAO / WAIKAPU DITCH  
SURFACE WATER AGREEMENT

TMK 3-5-01:07  
HAWAII LAND FARMING

387

PART 5  
SECTION 1

GRANT TO EDWARD 172 BAILEY

LCAM 375 TO KEKIPI

Area within  
water

AMENDMENT TO AGREEMENT CONCERNING  
WITHDRAWAL FROM THE IAO/WAIKAPU DITCH

This Amendment is made this 29th day of November,  
2007, by and between WAILUKU WATER COMPANY, LLC, a Hawaii  
limited liability company (successor in interest to Wailuku  
Agribusiness Co., Inc.), whose address is 255 E. Waiko Road,  
Wailuku, Hawaii 96793, hereinafter referred to as "Wailuku", and  
the COUNTY OF MAUI, through its DEPARTMENT OF WATER SUPPLY,  
whose address is 200 S. High Street, Wailuku, Hawaii 96793,  
hereinafter referred to as "DWS",

WITNESSETH:

WHEREAS, Wailuku Agribusiness Co., Inc. and DWS  
entered into that certain unrecorded Agreement Concerning  
Withdrawal from the Iao/Waikapu Ditch dated June 9, 2004,  
hereinafter called "Agreement", wherein Wailuku Agribusiness  
Co., Inc. allowed DWS to withdraw surface water from the  
Iao/Waikapu Ditch for the purpose stated in said Agreement; and

WHEREAS, Wailuku Agribusiness Co., Inc. assigned its  
interest in said Agreement to Wailuku; and

WHEREAS, Wailuku and DWS wish to amend the Agreement  
with respect to the term of the Agreement;

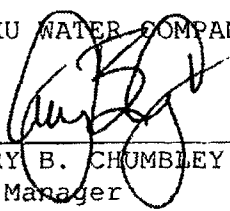
NOW, THEREFORE, the parties hereto agree that the  
Agreement is hereby amended to extend the term of the Agreement  
from December 1, 2007 to February 29, 2008.

No other amendments are made herein, and Wailuku and DWS do hereby ratify, confirm and acknowledge as being in full force and effect all of the terms and conditions of the Agreement not amended hereby.

The parties hereto agree that this instrument may be executed in counterparts, each of which shall be deemed an original, and said counterparts shall together constitute one and the same agreement, binding all of the parties hereto, notwithstanding all of the parties are not signatory to the original or the same counterparts. For all purposes, including, without limitation, recordation, filing and delivery of this instrument, duplicate unexecuted and unacknowledged pages of the counterparts may be discarded and the remaining pages assembled as one document.

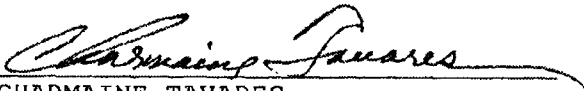
IN WITNESS WHEREOF, Wailuku and DWS have executed this instrument the day and year first above written.

WAILUKU WATER COMPANY, LLC

By   
AVERY B. CHUMBLEY  
Its Manager

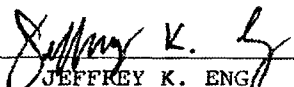
"Wailuku"

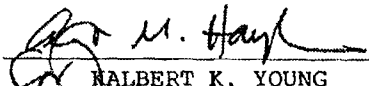
COUNTY OF MAUI, through its  
DEPARTMENT OF WATER SUPPLY

By   
CHARMAINE TAVARES  
Its Mayor

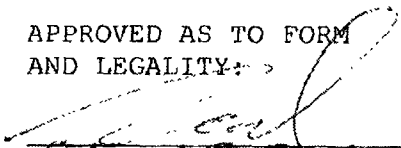
"DWS"

APPROVAL RECOMMENDED:

  
JEFFREY K. ENG  
Director of Water Supply

  
HALBERT K. YOUNG  
Director of Finance

APPROVED AS TO FORM  
AND LEGALITY: >

  
Edward S. Kushi, Jr.  
Deputy Corporation Counsel  
County of Maui

V.S.

Print Name: Terianne K. Arruda  
Notary Public, State of Hawaii.

My commission expires: August 15, 2010

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me appeared CHARMAINE TAVARES, to me personally known, who, being by me duly sworn, did say that she is the Mayor of the County of Maui, a political subdivision of the State of Hawaii, and that the seal affixed to said instrument is the lawful seal of said County of Maui, and that the instrument was signed and sealed in behalf of said County of Maui pursuant to Section 7.5.11 and Section 9-18 of the Charter of the County of Maui; and that the said CHARMAINE TAVARES acknowledged said instrument to be the free act and deed of said County of Maui.

Print Name: \_\_\_\_\_  
Notary Public, State of Hawaii.

My commission expires: \_\_\_\_\_

STATE OF HAWAII                    )  
                                          ) SS.  
COUNTY OF MAUI                    )

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me personally appeared AVERY B. CHUMBLEY, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.

Print Name: \_\_\_\_\_  
Notary Public, State of Hawaii.

My commission expires: \_\_\_\_\_

STATE OF HAWAII                    )  
                                          ) SS.  
COUNTY OF MAUI                    )

On this 30 day of November, 2007, before me appeared CHARMAINE TAVARES, to me personally known, who, being by me duly sworn, did say that she is the Mayor of the County of Maui, a political subdivision of the State of Hawaii, and that the seal affixed to said instrument is the lawful seal of said County of Maui, and that the instrument was signed and sealed in behalf of said County of Maui pursuant to Section 7.5.11 and Section 9-18 of the Charter of the County of Maui; and that the said CHARMAINE TAVARES acknowledged said instrument to be the free act and deed of said County of Maui.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

  
Print Name: LINDA K. TAMASHIRO  
Notary Public, State of Hawaii.

My commission expires: 10/19/2010

**SECOND AMENDMENT TO AGREEMENT CONCERNING  
WITHDRAWAL FROM THE IAO/WAIKAPU DITCH**

This Amendment is made this 27 day of February, 2008, by and between WAILUKU WATER COMPANY, LLC, a Hawaii limited liability company (successor in interest to Wailuku Agribusiness Co., Inc.), whose address is 255 East Waiko Road, Wailuku, Maui, Hawaii, 96793, hereinafter referred to as "Wailuku", and the COUNTY OF MAUI, through its DEPARTMENT OF WATER SUPPLY, whose address is 200 South High Street, Wailuku, Maui, Hawaii, 96793, hereinafter referred to as "DWS".

**W I T N E S S E T H:**

WHEREAS, Wailuku Agribusiness Co., Inc. and DWS entered into that certain unrecorded Agreement Concerning Withdrawal from the Iao/Waikapu Ditch dated June 9, 2004, hereinafter called "Agreement", wherein Wailuku Agribusiness Co., Inc. allowed DWS to withdraw surface water from the Iao/Waikapu Ditch for the purpose stated in said Agreement; and

WHEREAS, Wailuku Agribusiness Co., Inc. assigned its interest in said Agreement to Wailuku; and

WHEREAS, by agreement entitled "Amendment to Agreement Concerning Withdrawal from the Iao/Waikapu Ditch" dated November 29, 2007, the parties amended the Agreement by extending the term of the Agreement to February 29, 2008; and

WHEREAS, Wailuku and DWS wish to further amend the Agreement with respect to the term of the Agreement;

NOW, THEREFORE, the parties hereto agree that the Agreement is hereby amended to extend the term of the Agreement from March 1, 2008 to March 1, 2011, provided, however, as to the payment for the delivery of water by Wailuku to DWS, the price for delivery shall be amended to equal the tariff rate applicable to DWS, as determined by the Public Utility Commission (P.U.C.) of the State of Hawaii in Docket No. 2008-0025; said rate to commence upon on final order of the P.U.C. under the referenced docket, provided further the volume of water required to be delivered by Wailuku to DWS under this Agreement can be amended by Wailuku, at its discretion, after the Commission on Water Resource Management has determined the Interim Instream Flow Standards under Case No. CCH-MA06-01. Such modified volume shall be effective upon written notice of the same by Wailuku to DWS.

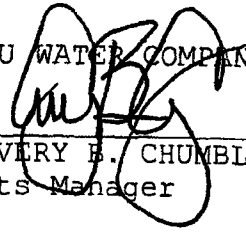
Wailuku and DWS agree that it is necessary for DWS to make certain changes to its in-take from the Iao/Waikapu Ditch in order for DWS to effectively withdraw surface water from the Iao/Waikapu Ditch for the purpose stated in this Agreement. DWS covenants that it will design such changes, such design being subject to Wailuku's reasonable written approval of the same, and DWS will complete the construction of such approved changes at its sole expense no later than six (6) months from the date of this Second Amendment. Failure by DWS to complete such

construction within said six (6) month period shall result in the right of Wailuku to terminate this Agreement by written notice to DWS.

No other amendments are made herein, and Wailuku and DWS do hereby ratify, confirm and acknowledge as being in full force and effect all of the terms and conditions of the Agreement not amended hereby.

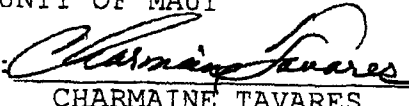
IN WITNESS WHEREOF, Wailuku and DWS have executed this instrument the day and year first above written.

WAILUKU WATER COMPANY, LLC

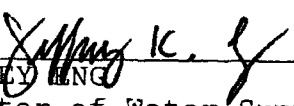
By:   
AVERY B. CHUMBLEY  
Its Manager

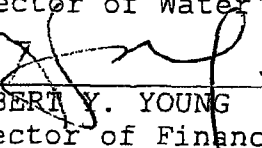
"Wailuku"

COUNTY OF MAUI

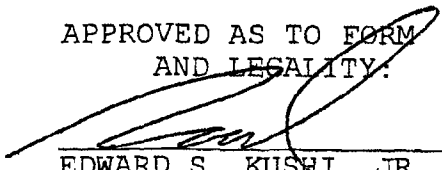
By:   
CHARMAINE TAVARES  
Its Mayor

APPROVAL RECOMMENDED:

  
JEFFREY KING  
Director of Water Supply

  
KALBERT Y. YOUNG  
Director of Finance

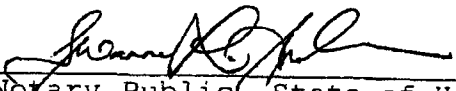
APPROVED AS TO FORM  
AND LEGALITY:

  
EDWARD S. KUSHI, JR.  
Deputy Corporation Counsel  
County of Maui

STATE OF HAWAII       )  
                              ) SS.  
COUNTY OF MAUI       )

On this 3rd day of March, 2008, before me personally appeared AVERY B. CHUMBLEY, to me personally known, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable, in the capacity shown, having been duly authorized to execute such instrument in such capacity.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

  
\_\_\_\_\_  
Notary Public, State of Hawaii

Print Name: Terianne L. Arreola

My commission expires: August 15, 2010

STATE OF HAWAII       )  
                              )SS.  
COUNTY OF MAUI       )

On this 27 day of February, 2008, before me personally appeared CHARMAINE TAVARES, to me personally known, who, being by me duly sworn or affirmed, did say that she is the Mayor of the County of Maui, a political subdivision of the State of Hawaii, and that the seal affixed to the foregoing instrument is the lawful seal of the said County of Maui, and that the said instrument was signed and sealed in behalf of said County of Maui by authority of its Charter, and the said CHARMAINE TAVARES acknowledged the said instrument to be the free act and deed of said County of Maui.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.



Notary Public, State of Hawaii

**LINDA K. TAMASHIRO**

Print Name: \_\_\_\_\_

My commission expires: 10/19/2010

**THIRD AMENDMENT TO AGREEMENT CONCERNING  
WITHDRAWAL FROM THE IAO/WAIKAPU DITCH**

This Amendment is made this 30<sup>th</sup> day of January, 2014, by and between WAILUKU WATER COMPANY, LLC, a Hawaii limited liability company (successor in interest to Wailuku Agribusiness Co., Inc.), whose address is P.O. Box 2790, Wailuku, Maui, Hawaii, 96793, hereinafter referred to as "Wailuku", and the COUNTY OF MAUI, through its DEPARTMENT OF WATER SUPPLY, whose address is 200 South High Street, Wailuku, Maui, Hawaii, 96793, hereinafter referred to as "DWS".

WITNESSETH:

WHEREAS, Wailuku Agribusiness Co., Inc. and DWS entered into that certain unrecorded Agreement Concerning Withdrawal from the Iao/Waikapu Ditch dated June 9, 2004, hereinafter called "Agreement", wherein Wailuku Agribusiness Co., Inc. allowed DWS to withdraw surface water from the Iao/Waikapu Ditch for the purpose stated in said Agreement; and

WHEREAS, Wailuku Agribusiness Co., Inc. assigned its interest in said Agreement to Wailuku; and

WHEREAS, by agreement entitled "Amendment to Agreement Concerning Withdrawal from the Iao/Waikapu Ditch" dated November 29, 2007, the parties amended the Agreement by extending the term of the Agreement to February 29, 2008; and

WHEREAS, in February 2008 by an agreement entitled "Second Amendment to Agreement Concerning Withdrawal from the Iao/Waikapu Ditch", the parties extended the terms of the Agreement to March 1, 2011; and

WHEREAS, the parties have continued the Agreement and abided by the terms of the

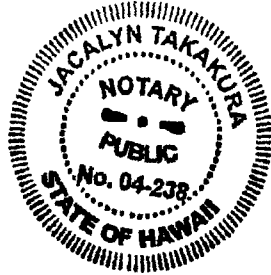
Agreement as of this date; and,

WHEREAS, Wailuku and DWS wish to further amend the Agreement with respect to the term of the Agreement;

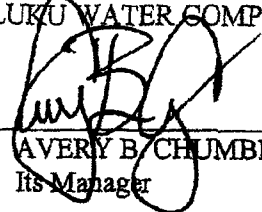
NOW, THEREFORE, the parties hereto agree that the Agreement is hereby amended to extend the term of the Agreement from March 1, 2011 to February 28, 2018, provided, however, as to the payment for the delivery of water by Wailuku to DWS, the price for delivery shall be amended to equal the tariff rate applicable to DWS, as determined by the Public Utility Commission (P.U.C.) of the State of Hawaii in Docket No. 2008-0025, said rate to commence upon on final order of the P.U.C. under the referenced docket; Provided further, the volume of water required to be delivered by Wailuku to DWS under this Agreement may be amended by Wailuku, at its discretion, after the Commission on Water Resource Management (the "Commission") has determined the Interim Instream Flow Standards, which determination by the Commission is currently pending. The amount of water to be delivered shall only be amended to the extent required by the Commission and no more. Lastly, the volume of water to be delivered may be amended by Wailuku, in its discretion, pursuant to the volume of water provided to DWS under the surface water use permit to be issued to DWS by the Commission. Such modified volume shall be effective upon written notice of the same by Wailuku to DWS, provided such volume shall not be less than the volume of water permitted to be delivered under said surface water use permit.

No other amendments are made herein, and Wailuku and DWS do hereby ratify, confirm and acknowledge as being in full force and effect all of the terms and conditions of the Agreement not amended hereby.

IN WITNESS WHEREOF, Wailuku and DWS have executed this instrument the day  
and year first above written.



WAILUKU WATER COMPANY, LLC

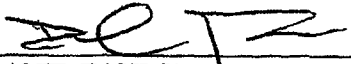
By:   
AVERY B. CHUMBLEY  
Its Manager

"Wailuku"

COUNTY OF MAUI

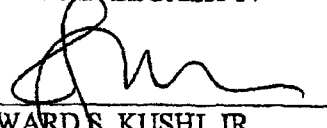
By:   
ALAN ARAKAWA  
Its Mayor

APPROVAL RECOMMENDED:

  
DAVID TAYLOR  
Director of Water Supply

  
DANNY AGSALOG  
Director of Finance

APPROVED AS TO FORM  
AND LEGALITY:

  
for EDWARD S. KUSHI, JR.  
Deputy Corporation Counsel  
County of Maui

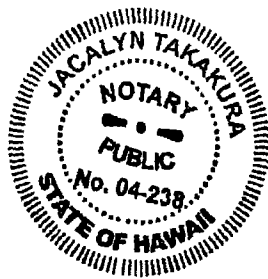
STATE OF HAWAII

County of Maui

)  
)SS.

On this 29th day of January, 20 14, before me personally appeared Avery Chumblay, to me personally known, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable, in the capacity shown, having been duly authorized to execute such instrument in such capacity.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.



Jacalyn Takakura  
Notary Public, State of Hawaii

Print Name: Jacalyn Takakura

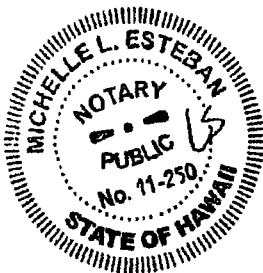
My commission expires: 05/02/16

Doc. Date: Undated # Pages: 5  
Name: Jacalyn Takakura Second Circuit  
Doc. Description: Third Amendment  
to Agreement concerning  
Withdrawal from the Lao/Waikapu Ditch  
Jacalyn Takakura 1/29/14  
Notary Signature Date  
NOTARY CERTIFICATION

STATE OF HAWAII       )  
                                  )SS.  
COUNTY OF MAUI       )

On this 30<sup>th</sup> day of January, 20 14, before me personally appeared ALAN ARAKAWA, to me personally known, who, being by me duly sworn or affirmed, did say that ~~he~~<sup>he is</sup> is the Mayor of the County of Maui, a political subdivision of the State of Hawaii, and that the seal affixed to the foregoing instrument is the lawful seal of the said County of Maui, and that the said instrument was signed and sealed in behalf of said County of Maui by authority of its Charter, and the said ALAN ARAKAWA acknowledged the said instrument to be the free act and deed of said County of Maui.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.



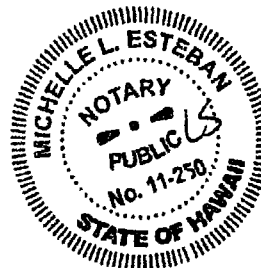
Michelle L. Esteban  
Notary Public, State of Hawaii

Print Name: MICHELLE L. ESTEBAN

My commission expires: 8-14-2015

Doc. Date: 1/30/2014 # Pages: 5  
Michelle L. Esteban       Second Circuit  
Doc. Description: 3rd Amendment  
Withdrawal from the lot  
Waikapu Ditch  
Michelle L. Esteban       1/30/2014  
Notary Signature                               Date

NOTARY CERTIFICATION



COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

|                                       |   |                                |
|---------------------------------------|---|--------------------------------|
| 'Iao Ground Water Management Area     | ) | Case No. CCH-MA06-01           |
| High-Level Source Water-Use           | ) |                                |
| Permit Applications and               | ) | FINDINGS OF FACT, CONCLUSIONS  |
| Petition to Amend Interim Instream    | ) | OF LAW, AND DECISION AND ORDER |
| Flow Standards of Waihe'e River       | ) |                                |
| And Waiehu, 'Iao, & Waikapū           | ) |                                |
| <u>Streams Contested Case Hearing</u> | ) |                                |

**FINDINGS OF FACT, CONCLUSIONS OF LAW, AND  
DECISION AND ORDER**

I hereby certify that the foregoing  
is a true and correct photocopy of the  
original document on file in the office of the  
Commission on Water Resource Management.

Dated JUN 10 2010 By W. Roy Hardy  
W. ROY HARDY, Hydrologic Program Manager  
for KEN C. KAWAHARA, P.E., Deputy Director

1 start with 3 acres of kalo lo'i and 4 acres of native plants (Horcajo, WDT 9/14/07, ¶¶ 5, 12, 14),  
2 Hui/MTF FOF D-313, D-316, D-317.

3 236. At least one person leased lands for commercial growing of kalo; Ho'opi'i, with 3.94  
4 acres, of which 3.5 acres has been leased to Aloha Poi for over 50 years. (Ho'opi'i WDT  
5 10/26/07, ¶¶ 4, 16.) Hui/MTF FOF D-180, D-185.

6 237. In addition to the mostly small parcels of land that comprised the approximately 135  
7 acres, North Shore at Waiehu, with 64 acres of land along the shore near Waiehu and 'Īao  
8 Streams, requested stream flow restoration so that springs would revive and help restore the  
9 wetlands that previously comprised about one-third of the property. (Ivy, WDT 3/7/08, ¶¶ 1-2, 9-  
10 10, 17-18.) Hui/MTF FOF D-358, D-364.

## 11 12 2. MDWS

13 238. In addition to water from the 'Īao Tunnel (Well No. 5332-02), MDWS receives water  
14 from the 'Īao-Waikapū Ditch, which is treated at its 'Īao Water Treatment Facility for domestic  
15 use. (Eng, Dec. 9/14/07, p. 8.) WWC FOF 190.

16 239. In June 2004 MDWS and WWC entered into an agreement until November 2007,  
17 extended to February 2008, allowing MDWS to receive up to 3.2 mgd from the 'Īao-Waikapū  
18 Ditch, with a fixed transportation fee of \$0.48 per thousand gallons. (Exhs. B-14, B-23, D-8(i),  
19 and D-93.)

## 20 21 3. WWC Delivery Agreements

22 240. WWC has water-delivery agreements with 34 entities in addition to its agreement with  
23 MDWS and HC&S. (Exh. D-96.)

24 241. WWC's table of customers does not identify the nature of the water uses, except to label  
25 them generally as either "agriculture" or "irrigation." Under WWC's terminology, "irrigation" is  
26 "agriculture," but on a shorter-term basis and also includes dust control. (Exh. D-96; Chumbley,  
27 Tr. 1/24/08, p. 64, l. 21 to p. 65, l. 13.) Hui/MTF FOF E-31.

28 242. WWC's table of customers also did not provide information on any acreages cultivated.  
29 (Exh. D-96.) Hui/MTF FOF E-32.

30 243. Several of WWC's customers provided testimony at the CCH:

1 requested party status in this contested case. (Eng, Dec. 9/14/07, ¶ 50.) MDWS FOF 41.  
2 368. Through an agreement with WWC, MDWS receives up to 3.2 mgd of surface water from  
3 the 'Iao-Waikapū Ditch and plans to increase the capacity to 4.0 mgd. (See FOF 239 and 305,  
4 *supra*.)  
5 369. MDWS also has had discussions with A&B concerning the potential for a surface water  
6 treatment plant to be located near the Waiale reservoir. (See FOF 306, *supra*.)  
7 370. MDWS has considered drilling new wells in the Waihe'e and Kahakuloa aquifers, but  
8 CWRM has asked MDWS to limit its withdrawals from the Waihe'e aquifer, and USGS has  
9 indicated that new wells there may not be as productive or cost-effective as hoped. (Eng, Dec.  
10 9/14/07, ¶ 27.) MDWS FOF 34.  
11 371. USGS has indicated that the Waikapū aquifer may be a possible source of new water  
12 supply, but the current sustainable yield of that aquifer is 2 mgd (Exh. B-13), and MDWS  
13 expects competition from private landowners for the available water in this aquifer. (Eng, Dec.  
14 9/14/07, ¶ 27.) MDWS FOF 46.  
15 372. The ability of MDWS to utilize water sources from East Maui is restricted by a consent  
16 decree in the case of Coalition to Protect East Maui Water Resources v. Board of Water Supply,  
17 County of Maui, Civ. No. 03-1-0008(3), December 2003.  
18 373. That consent decree requires that "(b)efore any new project is planned by the County of  
19 Maui to develop ground water in the agreed-upon portion of the East Maui Region, the County  
20 will vigorously investigate and pursue the availability of surface water from the Waikapū  
21 (60101), 'Iao (60102) and/or Waihe'e (60103) hydrologic units for public use by preparing a  
22 report which shall include a rigorous analysis of the costs and benefits of making these water  
23 resources part of Maui's public water system." (Exh. B-10, ¶ 4.3.) MDWS FOF 47.  
24

### 25 3. WWC Water Delivery Agreements

26 374. WWC estimated the amount of losses from its ditch system as a set percentage of 7.34  
27 percent, based primarily on a 20-year old report, Exh. D-4A. (Suzuki, Tr. 12/14/07, p. 164, l. 11  
28 to p. 165, l. 23.) Hui/MTF FOF E.35.  
29 375. The great majority of WWC's ditches are open and unlined. (Suzuki, Tr. 12/14/07, p.  
30 159, ll. 11-13; pp. 159-62.) All of WWC's reservoirs are unlined. (*Id.* p. 162, l. 25 to p. 164, l.  
31 10; Santiago, Tr. 2/22/08, p. 135, ll. 13-15.) Hui/MTF FOF E-36.

1 all other uses; i.e., maintaining/restoring stream flows and other reasonable-beneficial  
2 offstream uses. Whether or not a permit is required, the Commission must account for  
3 water losses by adopting provisions that limit such losses. COL 36, *supra*. Those  
4 provisions are presented in Section E on Losses, *infra*.

5 60. Kuleana lands also use stream waters for domestic and other uses (vegetables,  
6 trees, and plants). FOF 233. MDWS has allocated up to 540 gpd for households and 600  
7 to 1,200 gpd for agricultural development lots, FOF 401-402, which are reasonable  
8 amounts for kuleana lands for those purposes. The kalo lo'i reasonable use at between  
9 15,000 to 40,000 gad, however, is by far the dominant use, and the higher consumptive  
10 rate of 40,000 gad would be more than enough to account for domestic and other use.  
11 Thus, reasonable use for kuleana lands would be about 1.71 mgd. FOF 219-220.

12 61. MCLT seeks 1.5 to 2.5 mgd to restore its wetlands by raising the water table  
13 elevation between 12 to 18 inches and running freshwater through its fishpond to restore  
14 aquaculture conditions within the ancient fishpond limits. FOF 345. There was no  
15 testimony against these amounts being reasonable for the stated purposes, with the  
16 testimony focused on whether or not the underlying basal aquifer was a practical  
17 alternative to water from the Waihe'e River. FOF 353.

## 18 19 2. MDWS

20 62. All of MDWS's basal and high-level water sources in the 'Īao Ground Water  
21 Management Area and its surface water sources from Nā Wai 'Ehā are part of its  
22 integrated Central Maui System. FOF 362. In issuing water use permits to MDWS for its  
23 seven basal sources and for Shaft 33 in CCH-MA05-1 of January 31, 2007, the  
24 Commission found that MDWS's use met all of the requirements of HRS §174C-49(a),  
25 including that the uses were reasonable-beneficial. Therefore, its existing uses of surface  
26 water, FOF 239, 368, are for the same purposes, and the amounts of those uses would be  
27 reasonable. Of its 3.2 mgd capacity, MDWS used only 0.71 mgd in 2005 and 1.08 mgd in  
28 2006, or an average of 0.9 mgd. Table 7. Furthermore, its informal discussions to  
29 increase capacity from 3.2 to 4.0 mgd and to construct a new water treatment facility of  
30 up to 9 mgd capacity are too speculative. FOF 305-306. Thus, at most, MDWS's present  
31 and potential reasonable uses is 3.2 mgd.

1 system losses remaining after subtracting the 6 mgd to 8 mgd of losses from Waiale  
2 Reservoir and halving the estimated 3-4 mgd of losses in the ditch system. Practical  
3 alternatives are 9.5 mgd from Well No. 7, for a net reasonable use of 20.31 mgd (but see  
4 the variable nature of this alternative, explained below).

5 232. Therefore, total reasonable current and future uses, minus practical alternative  
6 water sources, for all diverted stream waters are 28.42 mgd: 1) 1.71 mgd for the kuleana  
7 lands; 2) 3.2 mgd for MDWS; 3) 3.20 mgd for WWC, consisting of 1.20 mgd for its  
8 Water Delivery Agreements and 2 mgd for system losses; and 4) 20.31 mgd for HC&S,  
9 consisting of 18.31 mgd for irrigation requirements and 2 mgd for system losses. The  
10 Commission is also cognizant of the large variations in day-to-day requirements for  
11 HC&S's fields described in COL 228, *supra*, and the reliability of Well No. 7 as a  
12 permanent, day-to-day source of 9.5 mgd, COL 230, *supra*, and will address these issues  
13 later in this Decision and Order.

14 233. If the total flow-through requirements for kalo lo'i are substituted for the  
15 consumptive use (6.84 mgd in place 1.71 mgd), the total reasonable uses would be 26.18  
16 mgd after subtracting for practical alternatives. As much as practical of these additional  
17 amounts, however, would have to be returned into the streams downstream of the  
18 diversions to the lo'i.

19 234. From Table 7, MDWS's 2005-2006 actual use averaged 0.90 mgd, and its current  
20 and future reasonable use would be 3.2 mgd, based on the capacity of its water treatment  
21 facility. Kuleana system users' flow-through requirements would remain at the 2005-  
22 2006 level of 6.84 mgd, of which 1.71 mgd would be consumed by the taro lo'i. For  
23 WWC's Water Delivery Agreements, average use in 2005-2006 was 1.90 mgd, and  
24 reasonable current and future uses would be about 2.02 mgd. WWC's estimated system  
25 losses averaged 4.06 mgd in 2005-2006, to be reduced to a reasonable loss of 2.0 mgd.

26 235. For HC&S's Waihe'e-Hopoi Fields, an average of 35.58 mgd was delivered to the  
27 Waiale Reservoir. Actual use in 2004-2006 was 6828 gad on 3350 acres, or 22.87 mgd.  
28 FOF 436. Therefore, 12.71 mgd, or 36%, was lost. Compared to actual use of 6828 gad,  
29 or 22.87 mgd, estimated requirements were 5958 gad, or 19.96 mgd. Thus, actual use was  
30 2.91 mgd, or 14.6%, over what was required. For the 'Iao-Waikapū Fields, an average of  
31 10.43 mgd was delivered. Actual use in 2004-2006 was 7716 gad on 1330 acres

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

|                                    |   |                      |
|------------------------------------|---|----------------------|
| 'Iao Ground Water Management Area  | ) | Case No. CCH-MA06-01 |
| High-Level Source Water Use        | ) |                      |
| Permit Applications and            | ) | ORDER                |
| Petition to Amend Interim Instream | ) |                      |
| Flow Standards of Waihe'e, Waiehu  | ) |                      |
| 'Iao, & Waikapu Streams            | ) |                      |
| <u>Contested Case Hearing</u>      | ) |                      |

COMMISSION ON WATER RESOURCE MANAGEMENT  
ORDER ADOPTING:

- 1) HEARINGS OFFICER'S RECOMMENDATION ON THE  
MEDIATED AGREEMENT BETWEEN THE PARTIES;  
AND
- 2) STIPULATION RE MEDIATOR'S REPORT OF JOINT PROPOSED  
FINDINGS OF FACT, CONCLUSIONS OF LAW, DECISION AND ORDER

The Commission on Water Resource Management has reviewed the 1) HEARINGS OFFICER'S RECOMMENDATION ON THE MEDIATED AGREEMENT BETWEEN THE PARTIES; and 2) the STIPULATION RE MEDIATOR'S REPORT OF JOINT PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, DECISION AND ORDER.

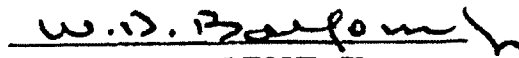
Based upon the Hearing Officer's recommendation, the Stipulation of the Parties, the Decision of the Hawaii Supreme Court on remand in this matter, the record and evidence in the Na Wai Eha proceedings, and after deliberation, the Commission on Water Resources Management hereby APPROVES AND ORDERS THE RECOMMENDATION AND STIPULATION ATTACHED HERE.

Dated: April 17, 2014

COMMISSION ON WATER RESOURCE MANAGEMENT ORDER ADOPTING: 1)  
HEARINGS OFFICER'S RECOMMENDATION ON THE MEDIATED AGREEMENT  
BETWEEN THE PARTIES; AND STIPULATION RE MEDIATOR'S REPORT OF JOINT  
PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, DECISION AND ORDER

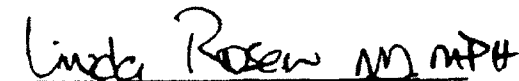
Dated: April 17, 2014

  
WILLIAM J. AILA, JR.

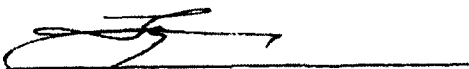
  
WILLIAM D. BALFOUR, JR.

  
KAMANAMAIKALANI BEAMER

  
MILTON D. PAVAO

  
LINDA ROSEN, M.D., M.P.H.

  
JONATHAN STARR

  
TED YAMAMURA

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

'Iao Ground Water Management Area )  
High-Level Source Water Use )  
Permit Applications and )  
Petition to Amend Interim Instream )  
Flow Standards of Waihe'e, Waiehu )  
'Iao, & Waikapu Streams )  
Contested Case Hearing )  
\_\_\_\_\_ )

Case No. CCH-MA06-01

ORDER

April 17, 2014

COMMISSION ON WATER RESOURCE MANAGEMENT  
ORDER ADOPTING:

- 1) HEARINGS OFFICER'S RECOMMENDATION ON THE  
MEDIATED AGREEMENT BETWEEN THE PARTIES;  
AND
- 2) STIPULATION RE MEDIATOR'S REPORT OF JOINT PROPOSED  
FINDINGS OF FACT, CONCLUSIONS OF LAW, DECISION AND ORDER

APPROVED:

  
\_\_\_\_\_  
DAVID M. LOUIE  
Attorney General, State of Hawaii

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

|                                      |                      |
|--------------------------------------|----------------------|
| 'Āao Ground Water Management Area )  | Case No. CCH-MA06-01 |
| High-Level Source Water Use )        |                      |
| Permit Applications and )            |                      |
| Petition to Amend Interim Instream ) |                      |
| Flow Standards of Waihe'e, Waiehu, ) |                      |
| 'Āao, & Waikapū Streams )            |                      |
| Contested Case Hearing )             |                      |

**Hearings Officer's Recommendation on the Mediated Agreement Between the Parties**

**Recommendation:**

Your hearings officer recommends that the Commission on Water Resource Management ("Commission") approve the mediated agreement (the "proposed D&O") between Hui O Na Wai Eha/Maui Tomorrow Foundation, Inc., the Office of Hawaiian Affairs, Hawaiian Commercial and Sugar Company, Wailuku Water Company LLC, and County of Maui, Department of Water Supply ("the Parties") and adopt the proposed D&O as its own Findings of Fact, Conclusions of Law, and Decision and Order for CCH-MA06-01, on remand from the Hawai'i Supreme Court.

**Summary:**

On June 10, 2010, the Commission issued its Findings of Fact, Conclusions of Law, and Decision and Order. The Commission restored 10 mgd for the IIFS for Waihe'e River, 1.6 mgd for the IIFS for North Waiehu Stream, 0.9 mgd for the IIFS for South Waiehu Stream, and no additions for 'Āao and Waikapū Streams. The Commission also held that the amount of water that HC&S would be required to pump from its Well No. 7 was 9.5 mgd.

Your hearings officer, Lawrence Mūike, was also the hearings officer for the original contested case hearing and had recommended that 14 mgd be added to Waihe'e River, 2.2 mgd to North Waiehu Stream, 1.3 mgd to South Waiehu Stream, 13 mgd to 'Āao Stream, and 4 mgd to Waikapū Stream. He also had recommended that HC&S be required to pump 14 mgd from its Well No. 7.

At the time of the first decision, your hearings officer was also a member of the Commission, therefore had a vote, and filed a dissent. He agreed with the reduction to Waihe'e River from his proposed 14 mgd to the majority's 10 mgd; to North and South Waiehu's

reduction from 2.2 mgd and 1.3 mgd, to 1.6 mgd and 0.9 mgd, respectively; and no restoration to Waikapū Stream. However, he disagreed with the majority's decision to restore no water to 'Īao Stream and the reduction of HC&S's Well No. 7 as an alternative source from his proposed 14 mgd to the majority's 9.5 mgd, and would have instead increased it as an alternative source to 18.54 mgd. He also concluded that the Commission could not presume that water restrictions on 5,000 acres of HC&S's 35,000-acre sugar operations would render its entire operations impractical.

The proposed D&O would retain the amounts restored to Waihe'e River and North and South Waiehu Streams in the Commission's 2010 D&O, and also restore 10 mgd to 'Īao Stream and 2.9 mgd to Waikapū Stream.<sup>1</sup>

#### Rationale:

The issues remanded to the Commission in the Hawai'i Supreme Court's decision on August 15, 2012, are summarized on both page 1 of the stipulation and pages 1-2 of the proposed D&O.

#### 1. Current and proposed stream flow restorations.

Restoring 10 mgd to Waihe'e River has resulted in an increase of natural habit units from less than 1% to 11.1%; and restoring 2.5 mgd to North and South Waiehu Stream resulted in an increase of natural habit units from 6.1% to 55.5%.

'Īao Stream has 49% of the total natural habitat units of the four streams. While Waikapū Stream has less than 1% of the total natural habitat units, it is the major contributor of inflow into Kealia Pond National Wildlife Refuge.

Individual and community groups testified that they rely or seek to rely on each of the Nā Wai 'Ehā streams for their exercise of traditional and customary Native Hawaiian practices.

Restoration of the streams in and of itself would support other beneficial instream uses and values.

#### 2. Hawaiian Commercial and Sugar Company.

---

<sup>1</sup> The IIFS for North Waiehu Stream has been changed from 1.6 mgd to 1.0 mgd, but this is a reflection of a change of the monitoring site and not a reduction in the IIFS. The 10 mgd for 'Īao Stream is also subject to reduction under certain low-flow circumstances, but only to accommodate the public water needs of the Maui Department of Water Supply and some kuleana users, both of which are court-identified public trust purposes along with restoration of the streams. While private commercial uses must overcome a presumption in favor of public trust purposes, there are no priorities among public trust purposes themselves.

The 300 acres of Fields 921 and 922 are not similar to Field 920, which was excluded from the calculation of HC&S's total acreage, and should therefore be included in the calculation of total acreage.

Well No. 7 as a source of irrigation water for HC&S should be increased from the 9.5 mgd of the 2010 D&O to 18.5 mgd.

A potential 2.95 mgd of wastewater reuse is not an immediately available option.

Reasonable system losses estimated at 2.0 mgd in the 2010 D&O should be increased to 2.15-4.20 mgd.

On the impact on HC&S of further increases in the IIFS, future viability of its operations is uncertain. The factor most essential to its economic viability after sugar prices is sugar production, and the most significant driver of sugar production is the availability of water for irrigation.

3. Wailuku Water Company LLC.

Reasonable system losses estimated at 2 mgd in the 2010 D&O should be increased to 2.73 mgd.

WWC's business model is sensitive to the volume of water from 'Īao and Waikapū Streams, particularly the former, and it is unable to increase revenue by adding new users or changing the rates it charges existing customers while its application for a certificate of public convenience and necessity is pending before the Public Utilities Commission.

4. Maui Department of Water Supply.

The estimate of 3.2 mgd of reasonable uses from 'Īao Stream in the 2010 D&O is affirmed and is preserved even in low flow conditions (see footnote 1, *supra*).

Conclusion:

The proposed Findings of Fact and Conclusions of Law have reasonably addressed the issues remanded by the Hawai'i Supreme Court to the Commission, and the proposed Decision and Order is a logical result of these findings and conclusions.

Finally, the parties have stipulated that any factual finding pertaining to water use requirements, alternative water sources, or system losses is made without prejudice to the rights

of the Parties and the Commission to revisit those issues in connection with any proceeding involving a Water Use Permit Application ("WUPA") for water diverted from any of the Nā Wai 'Ehā streams, inasmuch as the burden of proof with respect to such issues in a WUPA proceeding will be upon the applicant rather than upon the Commission.

DATED: Honolulu, Hawai'i April 6, 2014

A handwritten signature in cursive script, reading "Lawrence H. Miike", written over a horizontal line.

LAWRENCE H. MIIKE, Hearings Officer  
Commission on Water Resource Management

COMMISSION ON WATER RESOURCE MANAGEMENT  
OF THE STATE OF HAWAII

In the Matter of:

‘IAO GROUND WATER MANAGEMENT  
AREA HIGH-LEVEL SOURCE WATER  
USE PERMIT APPLICATIONS AND  
PETITION TO AMEND INTERIM  
INSTREAM FLOW STANDARDS OF  
WAIHE‘E, WAIHEHU, ‘IAO , & WAIKAPŪ  
STREAMS CONTESTED CASE HEARING

Case No. CCH-MA-06-01

STIPULATION RE MEDIATOR’S  
REPORT OF JOINT PROPOSED  
FINDINGS OF FACT, CONCLUSIONS OF  
LAW, DECISION AND ORDER; EXHIBIT  
“1”

Hearing Officer: Dr. Lawrence Milke

**STIPULATION RE MEDIATOR’S REPORT OF  
JOINT PROPOSED FINDINGS OF FACT,  
CONCLUSIONS OF LAW, DECISION AND ORDER**

The undersigned parties, through their respective counsel, stipulate to the following:

1. On August 15, 2012, following an appeal by Petitioners Hui O Nā Wai ‘Ehā and Maui Tomorrow Foundation, Inc. (“Hui/MTF”) and the Office of Hawaiian Affairs (“OHA”), the Hawai‘i Supreme Court (the “Court”) issued a decision vacating the Commission on Water Resource Management’s (the “Commission”) Findings of Fact, Conclusions of Law, and Decision and Order issued herein on June 10, 2010 (the “2010 D&O”) and remanding the matter to the Commission for further proceedings consistent with the decision (the “Remand Order”). The Court, among other things, held that the 2010 D&O did not adequately justify the Commission’s decision not to restore streamflow to ‘Iao and Waikapū Streams. *See, In re ‘Iao Ground Water Management Area High-Level Source Water Use Permit Applications (“Nā Wai ‘Ehā”)*, 128 Hawai‘i 228 at 249-54, 287 P.3d 129 at 150-55 (2012). The Court also instructed the Commission to consider the following matters on remand:

- i. The effect that IIFS will have on Native Hawaiian traditional and customary practices, and the feasibility of protecting the practices. *See id.* at 249, 287 P.3d at 150.

lmanageDB:27357143

- ii. Instream uses of the Nā Wai 'Ehā streams other than support of amphidromous species. *See id.* at 251, 287 P.3d at 252.
- iii. Whether HC&S's acreage for purposes of its irrigation requirements for fields irrigated with Nā Wai 'Ehā water should include Fields 921 and 922. *See id.* at 256, 287 P.3d at 157.
- iv. Reasonable estimation of the system losses of WWC and HC&S. *See id.* at 258, 287 P.3d at 159.
- v. Whether and to what extent Well No. 7 is a reasonable alternative water source for HC&S. *See id.* at 262, 287 P.3d at 163.
- vi. Whether and to what extent recycled wastewater from the Waihuku/Kahului wastewater treatment plant is a reasonable alternative water source for HC&S. *See id.* at 262, 287 P.3d at 163.

2. The remand contested case hearings were scheduled to begin on March 10, 2014. Shortly before the remand contested case hearings, the Commission chairperson William J. Aila, Jr. requested that the parties consider engaging in mediation to explore whether the remand issues could be resolved so that the Commission could enter a final Decision and Order in this matter without further appeals by the parties. The parties agreed to engage in mediation and Robbie Alm (the "Mediator") was agreed to by the parties and accordingly retained by the Commission to serve as mediator.

3. The parties thereafter participated diligently and in good faith in confidential mediation sessions facilitated by the Mediator from March 10, 2014 through March 14, 2014. These mediation sessions produced an agreement among the parties through the report of the Mediator of the results of the mediation to propose Interim Instream Flow Standards ("IIFS") for each of the Waihe'e, North & South Waiehu, 'Iao, and Waikapū Streams (collectively, the "Nā Wai 'Ehā Streams") to the Commission for its review and approval.

4. To facilitate the Mediator's Report and the Commission's review, approval and implementation of the parties' proposed IIFS for the Nā Wai 'Ehā Streams and consistent with the Commission's public trust duties, as clarified and defined in the Remand Order, the parties jointly prepared proposed Findings of Fact, Conclusions of Law, and Decision and Order in the form attached hereto as Exhibit "I".

5. If the Commission adopts the jointly proposed Findings of Fact, Conclusions of Law and Decision and Order without modification, each of the parties, by its signature hereupon, waives any objection to the admission of written testimonies submitted for the remand contested case proceeding and waives any objection to the admission of exhibits submitted for the remand contested case proceeding.

6. Each of the parties, by its signature hereupon, confirms that it is authorized to and has approved the jointly proposed Findings of Fact, Conclusions of Law, and Decision and Order in the form attached hereto as Exhibit "1", that it will support without modification the jointly proposed Findings of Fact, Conclusions of Law and Decision and Order before the Commission, that it will ask the Commission to adopt the jointly proposed Findings, Conclusions of Law, and Decision and Order without modification, and that it will waive any right to appeal if the Commission adopts the jointly proposed Findings of Fact, Conclusions of Law, Decision and Order without modification.

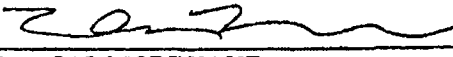
7. Each of the parties, by its signature hereupon, confirms that in the event the Commission fails to adopt the jointly proposed Findings of Fact, Conclusions of Law, and Decision and Order without modification, then the jointly proposed Findings of Fact, Conclusions of Law, and Decision and Order shall not be deemed to be a binding agreement by any of the parties thereto, shall remain confidential, and neither this Stipulation nor the proposed Findings of Fact, Conclusions of Law, and Decision and Order shall be offered as evidence or used in this or any subsequent administrative or judicial proceeding.

8. Each of the parties, by its signature hereupon, confirms that it will stipulate to the modification of procedures that apply to mediation before the Commission that are necessary to carry out the terms of this Stipulation.

9. Each of the parties, by its signature hereupon, confirms that it will execute such other documents as may be necessary to carry out the terms of this Stipulation.

10. This Stipulation may be signed electronically and in counterparts, each of which shall be deemed to be an original and all of which shall be combined into a single document

DATED: Honolulu, Hawaii, April 4, 2014.

  
\_\_\_\_\_  
ISAACH MORIWAKE  
D. KAPUA'ALA SPROAT  
SUMMER KUPAU-ODO

Attorneys for HUI O NĀ WAI 'EHĀ and  
MAUI TOMORROW FOUNDATION, INC.

\_\_\_\_\_  
ANNA ELENTO-SNEED  
PAMELA W. BUNN

Attorneys for OFFICE OF HAWAIIAN AFFAIRS

\_\_\_\_\_  
DAVID SCHULMEISTER  
ELIJAH YIP

Attorneys for HAWAIIAN COMMERCIAL AND SUGAR  
COMPANY

DATED: Kahului, Hawaii, April \_\_\_\_, 2014.

\_\_\_\_\_  
PAUL R. MANCINI  
JAMES W. GEIGER

Attorneys for WAILUKU WATER COMPANY LLC

\_\_\_\_\_  
STIPULATION RE MEDIATOR'S REPORT OF JOINT PROPOSED FINDINGS OF FACT, CONCLUSIONS OF  
LAW, DECISION AND ORDER; EXHIBIT "1"; In the Matter of 'Īao Ground Water Management Area High-  
Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe'e,  
Waiehu, 'Īao, & Waikapū Streams Contested Case Hearing, Case No. CCH-MA06-01

DATED: Honolulu, Hawaii, April \_\_\_\_, 2014.

\_\_\_\_\_  
ISAAC H. MORIWAKE  
D. KAPUA'ALA SPROAT  
SUMMER KUPAU-ODO

Attorneys for HUI O NĀ WAI 'EHĀ and  
MAUI TOMORROW FOUNDATION, INC.

  
\_\_\_\_\_  
ANNA ELENTO-SNEED  
PAMELA W. BUNN

Attorneys for OFFICE OF HAWAIIAN AFFAIRS

\_\_\_\_\_  
DAVID SCHULMEISTER  
ELIJAH YIP

Attorneys for HAWAIIAN COMMERCIAL AND SUGAR  
COMPANY

DATED: Kahului, Hawaii, April \_\_\_\_, 2014.

\_\_\_\_\_  
PAUL R. MANCINI  
JAMES W. GEIGER

Attorneys for WAILUKU WATER COMPANY LLC

STIPULATION RE MEDIATOR'S REPORT OF JOINT PROPOSED FINDINGS OF FACT, CONCLUSIONS OF  
LAW, DECISION AND ORDER; EXHIBIT "1"; In the Matter of 'Iao Ground Water Management Area High-  
Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waipae'e,  
Waichu, 'Iao, & Waikapu Streams Contested Case Hearing, Case No. CCH-MA06-01

DATED: Honolulu, Hawaii, April 4, 2014.

ISAAC H. MORIWAKE  
D. KAPUA'ALA SPROAT  
SUMMER KUPAU-ODO

Attorneys for HUI O NĀ WAI 'EHĀ and  
MAUI TOMORROW FOUNDATION, INC.

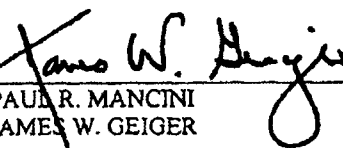
ANNA ELENTO-SNEED  
PAMELA W. BUNN

Attorneys for OFFICE OF HAWAIIAN AFFAIRS

  
DAVID SCHULMEISTER  
ELIJAH YIP

Attorneys for HAWAIIAN COMMERCIAL AND SUGAR  
COMPANY

DATED: Kahului, Hawaii, April 4, 2014.

  
PAUL R. MANCINI  
JAMES W. GEIGER

Attorneys for WAILUKU WATER COMPANY LLC

STIPULATION RE MEDIATOR'S REPORT OF JOINT PROPOSED FINDINGS OF FACT, CONCLUSIONS OF  
LAW, DECISION AND ORDER; EXHIBIT "I"; In the Matter of 'Āo Ground Water Management Area High-  
Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe'e,  
Waiehu, 'Āo, & Waikapū Streams Contested Case Hearing, Case No. CCH-MA06-01

-4-

lmanageDB:2735714.3

DATED: Wailuku, Hawaii, April 4, 2014.



PATRICK K. WONG  
JENNIFER M.P.E. OANA

Attorneys for COUNTY OF MAUI, DEPARTMENT OF  
WATER SUPPLY

STIPULATION RE MEDIATOR'S REPORT OF JOINT PROPOSED FINDINGS OF FACT, CONCLUSIONS OF  
LAW, DECISION AND ORDER; EXHIBIT "1"; In the Matter of 'Iao Ground Water Management Area High-  
Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe'e,  
Waichu, 'Iao, & Waikapu Streams Contested Case Hearing, Case No. CCH-MA06-01

-5-

ImageDB:2735714.3

COMMISSION ON WATER RESOURCE MANAGEMENT  
OF THE STATE OF HAWAII

In the Matter of:

'ĀO GROUND WATER MANAGEMENT  
AREA HIGH-LEVEL SOURCE WATER  
USE PERMIT APPLICATIONS AND  
PETITION TO AMEND INTERIM  
INSTREAM FLOW STANDARDS OF  
WAIHE'E, WAIEHU, 'ĀO, & WAIKAPŪ  
STREAMS CONTESTED CASE HEARING

Case No. CCH-MA-06-01

FINDINGS OF FACT, CONCLUSIONS OF  
LAW, DECISION AND ORDER;  
EXHIBITS "A" – "B"

**FINDINGS OF FACT,  
CONCLUSIONS OF LAW, DECISION AND ORDER**

**I. BACKGROUND**

1. These Findings of Fact, Conclusions of Law, Decision and Order are the final adjudication by the Commission on Water Resource Management (the "Commission") of the June 25, 2004 "Petition to Amend the Interim Instream Flow Standards for Waihe'e, North & South Waiehu, 'Āo, and Waikapū Streams and Their Tributaries" (the "Petition") filed by Petitioners Hui O Nā Wai 'Ehā and Maui Tomorrow Foundation, Inc. ("Hui/MTF").

2. Hui/MTF, the Office of Hawaiian Affairs ("OHA"), Hawaiian Commercial and Sugar Company ("HC&S"), Wailuku Water Company, LLC ("WWC"), and the County of Maui Department of Water Supply ("MDWS") participated in this matter. Hui/MTF, OHA, HC&S, WWC and MDWS collectively are called the "Parties."

3. The Commission, following a consolidated contested case hearing (the "Proceeding") for the Petition and for certain water use permit applications ("WUPAs") for

l:\manage\DB:2737882.1

**EXHIBIT "1"**

67. On remand, WWC submitted evidence that WWC's business model is sensitive to the volume of water available for diversion from 'Iao and Waikapū Streams, particularly the former, and that it is unable to increase revenue by adding new users or changing the rates it charges existing customers while its application for a certificate of public convenience and necessity is pending before the Public Utilities Commission. See Kuba WT 1/6/14 at 3-4, 10, 14-16; Exhs. D-R8, D-R9, D-R10; and Chumbley WT 1/7/14 at pp. 11-13.

3. **MDWS**

68. MDWS receives water from 'Iao Stream via the 'Iao-Waikapū Ditch, which is treated at its 'Iao Water Treatment Facility for municipal use, including domestic uses, for its water system serving Central and South Maui. See 2010 D&O, FOF 238; Taylor WT 1/3/14 at ¶¶ 6, 8 10-11.

69. Under WWC's agreement with MDWS, WWC must make available up to 3.2 mgd of water from 'Iao Stream to MDWS for the 'Iao Water Treatment Facility, subject to regulatory actions by the Commission. See 2010 D&O, FOF 239; Taylor WT 1/3/14 at ¶¶ 12-13; Exhs. B-14, B-23, B-R1 and B-R 14.

70. The Commission previously concluded that the 3.2 mgd of water for MDWS's 'Iao Water Treatment Facility was a reasonable current and future use of water from 'Iao Stream. 2010 D&O COL 62, 232.

71. This conclusion was not disturbed by the Remand Order and has not been challenged by any of the Parties in the Remand Proceeding.

72. Any factual finding herein pertaining to the water use requirements, alternative water sources, or system losses of a Party to the Proceeding or of a person who may apply for a water use permit or may apply for a water use permit in the future is made without prejudice to

context of any proceeding involving a WUPA by WWC, in which proceeding WWC will have the burden of justifying its water use in general, including its rate of system losses.

3. **MDWS**

18. The Commission reaffirms its prior conclusion that the 3.2 mgd of water for MDWS's 'Iao Water Treatment Facility is a reasonable current and future use of water diverted from 'Iao Stream for purposes of the restoration of stream flows under an amended IIFS. This is without prejudice, however, to the rights of any party and of the Commission to revisit this issue in the context of any proceeding involving a WUPA by MDWS, in which proceeding MDWS will have the burden of justifying its water use.

D. **Balancing of Instream Uses and Native Hawaiian Practices and Noninstream Uses**

19. Based on the foregoing Findings of Fact and Conclusions of Law and the evidence in the record of this Proceeding, as supplemented following the Remand Order, the Commission concludes that the amended IIFS set forth below in the Decision and Order, both individually and in the aggregate, represents a reasonable and equitable resolution of the Petition and balance between protecting instream uses and Native Hawaiian practices and accommodating reasonable beneficial noninstream uses, consistent with the Code and the public trust. As explained above, the amended IIFS substantially increases instream flows and protection of instream uses and Native Hawaiian practices in the Nā Wai 'Ehā Streams compared to the pre-Petition "status quo" IIFS. The amended IIFS also takes into account the impacts to present and potential noninstream uses and practicable alternatives and mitigation.

20. The Commission further recognizes the public policy in favor of settlement of litigation, including the Petition, which has been pending since 2004. The Commission concludes that the amended IIFS will enable the earlier interim protection of instream uses and Native Hawaiian practices without further delays in litigation, including appeals, and that this

1955 Main Street, Suite 200  
Wailuku, HI 96793

T: 808.244.7005  
F: 808.244.9026

RECEIVED  
CORPORATION COUNSEL

2013 DEC 27 AM 11: 52



December 27, 2013

Ms. Jennifer Dana, Deputy Corporation Counsel  
County of Maui  
Department of the Corporation Counsel  
200 South High Street, 3<sup>rd</sup> Floor  
Wailuku, HI 96793

1055.145235

Subject: Iao Ground Water Management Area High-Level Source Water Use Permit  
Applications and Petition to Amend Interim Instream Flow Standards of  
Waihee, Waiehu, Iao, & Waikapu Streams Contested Case Hearing before the  
Commission on Water Resources Management; Case No. CCH-MA06-01

Dear Ms. Dana,

At your request, Brown and Caldwell has reviewed the documents provided by the County of Maui and conducted an engineering analysis of the impact to the County of Maui Department of Water Supply (MDWS) should the Commission for Water Resources Management (CWRM) eliminate the County's allocation of flow of Na Wai Eha surface water. In addition, we have assessed the economic benefits to the County if it were to receive a larger allocation of Na Wai Eha surface water.

### Qualifications

Brown and Caldwell is an environmental engineering and consulting firm with offices located nationwide. Brown and Caldwell has had an office on Maui for over 20 years, and we have assisted the County of Maui with planning and design of water and wastewater infrastructure projects throughout our period of presence on the island.

This report was prepared by Craig Lekven. Craig is a registered Professional Civil Engineer in Hawaii and California, and has 25 years of experience planning and designing water and wastewater infrastructure projects. Craig is the Supervising Engineer in Brown and Caldwell's Maui office, and has managed projects for the County of Maui throughout his 5 year tenure on the island.

### Documents Reviewed

Table 1 lists the documents that were reviewed as part of the preparation of this report.

Table 1. Documents Reviewed

| Ref. No. | Title                                                                                                                                                                                                                                                                                                            | Author                                                                                                                                                                | Date                |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1        | Central Maui Recycled Water Verification Study                                                                                                                                                                                                                                                                   | County of Maui Department of Environmental Management, Wastewater Reclamation Division<br>County of Maui Department of Water Supply, Water Resource Planning Division | December 2010       |
| 2        | Central Maui Service Area (graphic)                                                                                                                                                                                                                                                                              | County of Maui Department of Water Supply                                                                                                                             | November 29, 2013 * |
| 3        | North Central Service Area (graphic)                                                                                                                                                                                                                                                                             | County of Maui Department of Water Supply                                                                                                                             | November 29, 2013 * |
| 4        | South Central Service Area (graphic)                                                                                                                                                                                                                                                                             | County of Maui Department of Water Supply                                                                                                                             | November 29, 2013 * |
| 5        | Declaration of Jeffrey K. Eng                                                                                                                                                                                                                                                                                    | Jeffrey K. Eng                                                                                                                                                        | September 14, 2007  |
| 6        | Central/South Maui Desalination Feasibility Study, Final Report                                                                                                                                                                                                                                                  | Brown and Caldwell                                                                                                                                                    | December 2006       |
| 7        | Maui County Department of Water Supply Water Conservation Efforts                                                                                                                                                                                                                                                | County of Maui Department of Water Supply                                                                                                                             | November 29, 2013 * |
| 8        | Maui County Water Use and Development Plan, Central District, Final Candidate Strategies Report, Report Review Draft                                                                                                                                                                                             | Carl Freedman, Haiku Design & Analysis                                                                                                                                | June 17, 2009       |
| 9        | Findings of Fact, Conclusions of Law, and Decision and Order in the matter of the Iao Ground Water Management Area High-Level Source Water-Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihee River and Waiehu, Iao, & Waikapu Streams Contested Case Hearing (CCH-MA06-01) | State of Hawaii Department of Land and Natural Resources Commission on Water Resources Management                                                                     | June 10, 2010       |
| 10       | Maui County Water Use and Development Plan, Central DWS District Plan Update                                                                                                                                                                                                                                     | County of Maui Department of Water Supply                                                                                                                             | November 16, 2010   |
| 11       | Maui Island Plan, Chapter 1: Population                                                                                                                                                                                                                                                                          | Maui County Planning Department                                                                                                                                       | December 28, 2012   |
| 12       | Responsive Witness Statement of County of Maui Department of Water Supply in the Form of a Supplemental Declaration of Jeffrey K. Eng                                                                                                                                                                            | Jeffrey K. Eng                                                                                                                                                        | October 26, 2007    |
| 13       | Socio-Economic Forecast, The Economic Projections for the Maui County General Plan 2030                                                                                                                                                                                                                          | Maui County Planning Department                                                                                                                                       | June 2006           |
| 14       | South Maui R-1 Recycled Water Verification Study                                                                                                                                                                                                                                                                 | County of Maui Department of Environmental Management, Wastewater Reclamation Division<br>County of Maui Department of Water Supply, Water Resource Planning Division | December 2009       |
| 15       | In re: Iao Ground Water Management Area High-Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihee River and Waiehu, Iao, and Waikapu Streams Contested Case Hearing                                                                                        | Supreme Court of Hawaii                                                                                                                                               | August 15, 2012     |
| 16       | MDWS spreadsheet "Billing MAV December 2007-2012"                                                                                                                                                                                                                                                                | County of Maui Department of Water Supply                                                                                                                             | December 10, 2013 * |
| 17       | 2012 Iao Operational Costs - e-mail from Dave Taylor, Director of MDWS                                                                                                                                                                                                                                           | County of Maui Department of Water Supply                                                                                                                             | December 12, 2013   |
| 18       | Na Wai Eha - Questions and Answers from the Planning Department                                                                                                                                                                                                                                                  | County of Maui Department of Planning                                                                                                                                 | December 9, 2013 *  |

\* No printed date on document; date shown is the PDF computer file date.

## Population Projections

The population of Maui Island (including both residents and visitors) is projected to grow in the future. Table 2 summarizes the island population projections [Reference 11]. The total island population is projected to increase a total of 58,034 residents and daily visitors between the year 2010 and 2030, a 32 percent increase.

**Table 2. Maui Islandwide Population Projections**

| Description | Year    |         |         |
|-------------|---------|---------|---------|
|             | 2010    | 2020    | 2030    |
| Residents   | 144,444 | 169,540 | 194,630 |
| Visitors    | 38,485  | 43,100  | 46,333  |
| Total       | 182,929 | 212,640 | 240,963 |

Note: Values obtained from Reference 11.

Population projections have also been developed for the area that comprises the MDWS Central Service Area. Table 3 presents the population projections for the service area. The service area population is projected to increase by 36 percent from 2010 to the year 2030.

**Table 3. Resident Population Projections for Central Maui Service Area**

| Description                   | Value      |
|-------------------------------|------------|
| Year 2010 resident population | 84,414     |
| Year 2030 resident population | 114,899    |
| Resident population increase  | 30,485     |
| Increase                      | 36 percent |

Source: Reference 18

## Water Demand Projections

The demand for domestic water will grow as the population grows. MDWS has developed demand projections that are summarized in Table 4. MDWS has used the "baseline case" projection as the basis for its planning efforts.

**Table 4. Central Maui District Water Demand Projections**

| Scenario         | Average Annual Demand in Year |          | Increase |
|------------------|-------------------------------|----------|----------|
|                  | 2010                          | 2030     |          |
| Low case         | 20.5 mgd                      | 28.2 mgd | 7.7 mgd  |
| Medium low case  |                               | 31.1 mgd | 10.6 mgd |
| Baseline case    |                               | 34.1 mgd | 13.6 mgd |
| Medium high case |                               | 36.8 mgd | 16.3 mgd |
| High case        |                               | 39.9 mgd | 19.4 mgd |

Note: Values derived from References 10 and 16.

The values shown in Table 4 are average annual demands. Domestic water use varies throughout the year. Consumption will generally be greater during the summer months because customers will use more water for irrigation and other outdoor purposes. Water demand is typically lower than the annual average during the winter months because precipitation provides much of the water that landscapes require to thrive. A water utility must be able to provide water to meet its customers' demand needs at all times, and therefore must have capacity and water sources that are greater than the average annual demand. Water utilities consider the following factors when determining future needs:

- Peak day demands – to ensure enough water is available at all times.
- Reliability factors – to ensure sufficient water supply to its customers even if elements of the water supply system are offline for maintenance purposes.
- Unmetered losses – system leakage and other unmetered losses that are typical for all water distribution systems.

Table 5 summarizes the MDWS capacity needs to reliably meet the baseline case demand scenario.

| Table 5. Central Maui District Average Production Capacity Needs |                       |                       |          |
|------------------------------------------------------------------|-----------------------|-----------------------|----------|
| Description                                                      | Year                  |                       | Increase |
|                                                                  | 2010                  | 2030                  |          |
| Average production                                               | 24.2 mgd <sup>a</sup> | 37.9 mgd <sup>b</sup> | 13.7 mgd |

<sup>a</sup> Reference 16.

<sup>b</sup> "Baseline case" demand scenario in Reference 10.

## Existing Sources for Central Maui Water System

Table 6 provides a summary of the sources that MDWS currently relies upon to supply its integrated Central Maui System.

**Table 6. Available Source Based on Permit Limits and Operational Constraints**

| Name                      | Source System                 | Source Flow Limit (mgd) |
|---------------------------|-------------------------------|-------------------------|
| Kepaniwai Well            | Iao Aquifer - High Level Dike | 0.791 <sup>a</sup>      |
| Iao Tunnel                | Iao Aquifer - High Level Dike | 1.610 <sup>a</sup>      |
| Iao Water Treatment Plant | Iao-Waikapu Ditch             | 1.700 <sup>b</sup>      |
| Mokuhan Well 1            | Iao Aquifer - Basal           | 1.500 <sup>a</sup>      |
| Mokuhan Well 3            | Iao Aquifer - Basal           | 2.353 <sup>a</sup>      |
| Shaft 33                  | Iao Aquifer - Basal           | 5.015 <sup>a</sup>      |
| Waiehu Heights 1          | Iao Aquifer - Basal           | 0.200 <sup>a</sup>      |
| Waiehu Heights 2          | Iao Aquifer - Basal           | 0.800 <sup>a</sup>      |
| Waihee Well 1             | Iao Aquifer - Basal           | 1.900 <sup>a</sup>      |
| Waihee Well 2             | Iao Aquifer - Basal           | 1.500 <sup>a</sup>      |
| Waihee Well 3             | Iao Aquifer - Basal           | 3.400 <sup>a</sup>      |
| North Waihee 1            | Waihee Aquifer                | 4.000 <sup>c</sup>      |
| North Waihee 2            | Waihee Aquifer                |                         |
| Kanoa 1                   | Waihee Aquifer                |                         |
| Kanoa 2                   | Waihee Aquifer                |                         |
| Maui Lani Well 5          | Kahului Aquifer               | 1.200 <sup>c</sup>      |
| Maui Lani Well 6          | Kahului Aquifer               |                         |
| Maui Lani Well 7          | Kahului Aquifer               |                         |
| Total                     |                               | 25.969                  |

<sup>a</sup> CWRM Water Use Permit.

<sup>b</sup> Current WTP reliable capacity.

<sup>c</sup> CWRM recommended limit for aquifer system.

## Strategies to Meet Future Demands

MDWS has evaluated five final candidate strategies (in Reference 10) to meet the long-term future demands in the Central Maui system:

- Northward basal groundwater development.
- Eastward basal groundwater development.
- Expand use of Na Wai Eha surface water.
- Desalination of brackish groundwater.
- Maximization of recycled water use and water conservation.

The strategies share common elements including:

- Projects that are in the process of being implemented but are not yet in service.
- Two new wells in the Waikapu aquifer to meet near-term needs.
- Backup and replacement wells for existing well systems.
- Conservation and efficiency measures.
- Exploratory and investigative measures.
- Watershed protection and restoration measures.
- Stream restoration measures.

All strategies consist of a group of projects designed to reliably meet the future water demands of the customers. Each strategy is discussed below.

#### **Northward Basal Groundwater Development**

The northward basal groundwater development strategy consists of adding new wells in the north side of the Waihee aquifer and in the Kahakuloa aquifer. A total of sixteen wells, plus transmission pipelines, storage tanks, and booster pump stations would be added to meet future needs.

The northward basal groundwater development strategy is not viable for MDWS. The CWRM has verbally asked MDWS to limit its withdrawals from the Waihee aquifer, and the United States Geological Survey (USGS) has indicated that wells in the Kahakuloa aquifer may not be as productive as hoped.

#### **Eastward Basal Groundwater Development**

The eastward basal groundwater development strategy consists of adding a series of new wells in the Haiku aquifer. MDWS evaluated a number of different potential configurations in the development of this strategy, and concluded the most cost effective system would be drill wells at the 1000-foot elevation. Transmission pipelines, storage tanks, and booster pump stations would be added to meet future needs.

MDWS entered into a Consent Decree in 2003 that requires that the Department vigorously investigate and pursue additional Na Wai Eha surface water and conduct rigorous cost/benefit analyses of other water source options before developing groundwater in the East Maui region. The Maui County Water Use and Development Plan and other studies constitute rigorous cost/benefit analyses of the available options. Development of eastward basal groundwater is a viable strategy to meet future needs from a technical perspective, however there are legal issues that must be resolved before MDWS can proceed with implementation.

#### **Expand Use of Na Wai Eha Surface Water**

MDWS currently has an agreement with Wailuku Water Company (WWC) for delivery of up to 3.2 mgd of surface water from the Iao-Waikapu Ditch. The water is treated at the Iao Water Treatment Plant (WTP) prior to introduction to the distribution system. The Iao WTP currently has a peak production capacity of 2.3 mgd, and MDWS is currently able to produce approximately 1.7 mgd. The WTP process can be expanded to deliver the full 3.2 mgd flow in the future.

MDWS has had discussions with Alexander and Baldwin (A&B) regarding construction of a new WTP to treat Na Wai Eha surface water. A&B has designed the Waiale WTP with 9.0 mgd of capacity in anticipation of future housing needs.

MDWS has evaluated a number of options in the development of the Na Wai Eha surface water strategy, including a WTP located in Waihee and the implementation of a surface water storage reservoir in conjunction with a new WTP. MDWS has determined that the most cost-effective way to implement the strategy to expand use of Na Wai Eha surface water is via construction of the Waiale WTP. However, implementation of the strategy would require a larger allocation of Na Wai Eha stream water.

#### **Desalination of Brackish Groundwater**

MDWS conducted a feasibility study that considered desalination of brackish groundwater or sea water (Reference 6). The study determined that desalination of brackish groundwater was the more cost-effective option of the two.

The desalination of brackish groundwater strategy includes the development of a 5.0 mgd reverse osmosis desalination facility in Central Maui to meet a portion of the future needs. Brackish groundwater would be pumped from the Kahului aquifer to supply the water treatment plant. The reverse osmosis process would remove salt and other minerals from the water to create potable water that would be introduced into the distribution system. The desalination process creates a brine residual liquid stream that requires disposal. Disposal via deep injection wells into salt water below the groundwater lens is considered to be the most practical and economical brine management solution.

The desalination of brackish groundwater strategy is considered feasible, but the desalination process is an expensive, complex, and energy-intensive way to meet future needs. The uncertainty associated with future energy

prices, and Maui's dependence on imported energy sources adds significant implementation risk to a desalination strategy to meet future needs. Furthermore, the environmental issues associated with brine disposal makes desalination an unattractive strategy when other viable sources are available.

#### Maximization of Recycled Water Use and Water Conservation

The maximization of recycled water use and water conservation strategy consists of significantly greater MDWS investment into measures to displace potable water use with recycled water and demand reduction via water conservation measures. Each is discussed separately below.

##### Use of Recycled Water

Recycled water is highly treated wastewater effluent that can be safely used for beneficial non-potable uses. Recycled water is sometimes referred to as "reclaimed water", but the term "recycled water" has been accepted as the standard industry term and will be used in this report. The State of Hawaii Department of Health (DOH) regulates the treatment and use of recycled water, and has established minimum treatment requirements for a variety of uses:

- R-1 recycled water has received the highest amount of treatment, including oxidation, filtration, and disinfection to meet the standards established by DOH.
- R-2 recycled water has been oxidized and disinfected to meet the standards established by DOH. Less disinfection is required for R-2 water than R-1 water.

Table 7 is a partial list of some of the allowable uses for R-1 and R-2 recycled water. As shown in the table, R-1 water may be used for irrigation purposes at locations where the public may come in direct contact with the recycled water. The use of R-2 water is generally allowed where public access is restricted or direct public contact is otherwise prevented by some means.

Table 7. Partial List of Allowable Recycled Water Uses

| R-2 Recycled Water                                                                                                                 | R-1 Recycled Water                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Subsurface irrigation of parks, golf courses, and schools                                                                          | All uses allowed for R-2 recycled water                                                                               |
| Any form of irrigation of fodder crops, or food crops that undergo extensive processing that render them free of viable pathogens, | Any form of irrigation of food crops, where the recycled water comes into contact with the edible portion of the crop |
| Any form of irrigation of cemeteries and freeway landscaping                                                                       | Any form of irrigation of golf courses, parks, and schools                                                            |
| Any form of landscape irrigation where public access is limited                                                                    | Any form of irrigation of pasture for milking animals                                                                 |
| Construction water and dust control on unpaved roads                                                                               | Fire control                                                                                                          |

The County of Maui Department of Environmental Management (DEM) owns and operates the Wailuku-Kahului Wastewater Reclamation Facility (WWRF) and the Kihei WWRF in the Central District. Both WWRFs currently produce recycled water, as summarized in Table 8.

Table 8. Central Maui Recycled Water Status

| Description                      | Kihei WWRF                                                                                                                                                     | Wailuku-Kahului WWRF                                                                      |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Type of recycled water produced  | R-1                                                                                                                                                            | R-2                                                                                       |
| Current uses                     | Landscape irrigation<br>Agricultural irrigation<br>Cooling water<br>Fire control<br>Toilet/urinal flushing<br>Composting<br>Erosion control<br>Cattle watering | Irrigation of WWRF landscaping<br>WWRF process uses<br>Construction water<br>Dust control |
| Average daily recycled water use | 1.38 mgd                                                                                                                                                       | 0.2 mgd                                                                                   |
| Percentage of total WWRF flow    | 38 percent                                                                                                                                                     | 5 percent                                                                                 |

Sources: References 1 and 14.

MDWS has included the use of recycled water as part of a strategy to meet future potable water needs. The strategy consists of using recycled water to displace current non-potable uses (e.g., irrigation), to allow the potable water to be used for other potable needs. The strategy also includes extensive water conservation measures, discussed further in the next section. Projects to increase recycled water use have been identified for both WWRFs.

**Kihei WWRF:** Water recycling can be expanded in Kihei by expanding the recycled water distribution pipeline system. The distribution system expansion options are summarized in Table 9. MDWS has included the listed projects in its strategy of maximization of recycled water use and water conservation.

Table 9. Recycled Water Use Expansion Options Identified for Kihei WWRF

| Expansion Description                   | Estimated Peak Potable Water Displacement (mgd) | Capital Cost *  |
|-----------------------------------------|-------------------------------------------------|-----------------|
| Waipulani Street / South Kihei Road     | 0.200                                           | \$1.36 million  |
| Liloa Drive / Kihei High School         | 0.245                                           | \$1.28 million  |
| North Kihei Road / South Collector Road | 0.553                                           | \$4.25 million  |
| Piilani Highway to Wailea Resort        | 1.196                                           | \$23.65 million |
| Total                                   | 2.194                                           | \$30.54 million |

\* Adjusted to current (December 2012) dollars

Unfortunately, there is insufficient R-1 water production at the Kihei WWRF to support all of the projects listed in the table. As with potable water, recycled water producers have to be able to meet their customers' needs at all times. Recycled water demand peaks during the summer months, and DEM estimates that it has as little as 1.0 mgd of excess recycled water available during the peak demand months of summer [Reference 14]. Therefore, only about 1.0 mgd of additional potable water displacement is possible, unless DEM were to supplement R-1 water

production with brackish groundwater or construct a seasonal storage reservoir at significant expense. The MDWS economic analyses in Reference 10 did not consider supplemental water or seasonal storage needs, which would increase the overall costs.

**Wailuku-Kahului WWRF:** Water recycling can be expanded at the Wailuku-Kahului WWRF by supplying R-2 water to a single user for sugar cane seed crop irrigation, or upgrading the treatment processes to produce R-1 water so that the recycled water can be supplied to multiple users. The R-2 approach would benefit DEM by reducing its reliance on injection wells for effluent disposal, and would benefit Hawaiian Commercial & Sugar (HC&S) by displacing irrigation water currently obtained from Na Wai Eha surface water (but at significantly higher cost). The estimated capital cost to supply R-2 water to HC&S is \$12.3 million. The R-2 approach would not directly benefit MDWS in the form of potable water displacement. Upgrading the WWRF to produce R-1 water would provide the above benefits and also benefit MDWS in the form of potable water displacement.

DEM has identified projects to upgrade the Wailuku-Kahului WWRF to produce and distribute R-1 recycled water in the Kahului area. Table 10 summarizes the recycled water projects, and the estimates of the potable water that would be displaced to the benefit of MDWS.

Table 10. Recycled Water Projects Identified for Wailuku-Kahului WWRF

| Description                                                                                                        | Estimated Peak Potable Water Displacement (mgd) | Primary Users                                                                                                                                                                                                                                                                  | Capital Cost <sup>a</sup> |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| R-1 upgrades at WWRF                                                                                               | 0                                               | Not applicable                                                                                                                                                                                                                                                                 | \$5.37 million            |
| Distribution from WWRF to Maui Lani                                                                                | 0.191                                           | 17 properties, including Maui Lani Golf Course, Keopuolani Park, Maui Lani Park and Common areas, UH Maui, War Memorial Complex, Kaahumanu Center, Boys & Girls Club of Maui, and others. Most of the larger users currently use brackish groundwater for irrigation purposes. | \$25.94 million           |
| Distribution from WWRF to Kahului Airport                                                                          | 0.225                                           | Kanaha Beach Park, Kahului Airport                                                                                                                                                                                                                                             | \$4.29 million            |
| Distribution from Queen Kaahumanu Center to existing HC&S pipelines formerly used for pineapple cannery wastewater | 0.185                                           | HC&S Seed Cane, Maui High School, Kahului CC & Park, Kahului Elementary School, Hale Mahaolu                                                                                                                                                                                   | \$2.00 million            |
| Total                                                                                                              | 0.601                                           |                                                                                                                                                                                                                                                                                | \$37.60 million           |

<sup>a</sup> Adjusted to current (December 2012) dollars

The average day demand for recycled water will be less than the peak demand that occurs during the summer months. The ratio of peak demand to average annual demand is a function of climate conditions and the characteristics of the crop being irrigated. In Central Maui the average annual demand will be approximately 63 percent of the peak demand, based on other projects we've completed. Table 11 summarizes our estimate of the total potential average annual potable water displacement in the Central Maui District.

**Table 11. Potential Potable Water Displacement in Central Maui by Recycled Water**

| Area                 | Peak Potable Water Displacement Potential (mgd) | Annual Average Potable Water Displacement Potential <sup>a</sup> (mgd) |
|----------------------|-------------------------------------------------|------------------------------------------------------------------------|
| Kihai WWRF           | 1.0                                             | 0.63                                                                   |
| Wailuku-Kahului WWRF | 0.601                                           | 0.38                                                                   |
| Total Potential      | 1.601                                           | 1.01                                                                   |

<sup>a</sup> Assumes average annual demand is 63 percent of peak demand.

### Conservation and Efficiency Measures

All of the strategies presented above include conservation and efficiency measures. MDWS' conservation measures have included:

- Leak detection and repair to reduce distribution system losses.
- Preventative and predictive maintenance to reduce system losses.
- Reclaimed water use that displaces potable water use, as described above.
- Back-up sources so that in the event of a major leak most areas can be isolated and served by alternate sources.
- Watershed and resource protection – MDWS funding to watershed partnerships has totaled \$17.3 million from 1997 to the present.
- Low-flow fixture distribution, including showerheads, bathroom aerators, kitchen aerators, self-closing hose nozzles, and leak detection dye tablets.
- Water audits and direct fixture retrofits.
- Water conservation pricing to encourage conservation.
- Development of regulations related to water conservation.
- Public education and outreach activities.

MDWS' long-term planning efforts have also considered implementation of extensive water conservation measures as a strategy to meet future needs. Water conservation achievements are typically expressed as a percentage of the "technical potential". The technical potential is an estimate of the amount of water that could potentially be saved by implementing water conservation measures and practices. MDWS economic analyses have shown that a water conservation program goal to achieve 45 percent of the technical potential would yield the best economic returns. The types of conservation measures that have been identified as having good potential to help achieve 45 percent of the technical potential include:

- Residential / commercial audits and direct installation for indoor and landscape irrigation users.
- Education and publicity program to encourage water conservation and promote program participation.
- Direct installation of efficient fixtures at customer premises including toilets, showerhead, and sink faucet flow restrictors.
- Audits of existing irrigation system equipment and practices and specific resulting recommendations to customer to improve efficiency.
- Direct installation of targeted "high payback" fixtures in commercial premises.
- High efficiency fixture rebates.
- High efficiency washing machines.
- High efficiency toilets and waterless urinals.
- Hotel awards program.
- Building manager user groups and services.
- Agricultural user group and services.

Some water conservation measures will result in tangible source water savings that can be reliably allocated to new users, while other types of measures rely on customer behavioral changes that can relapse and diminish the water savings. For example, detecting and repairing distribution leaks results in water savings that can be safely allocated to new customers. However, measures that rely on customer behavioral changes present a challenge to water agencies as to whether or not the realized water savings can be safely allocated to new customers; if the behavior changes are not permanent the water savings are reduced and the water agency could end up being short of water. Therefore, some types of conservation measure savings can be safely used as equivalents to new source, but others cannot until the water agency is comfortable that the resulting savings are permanent.

### Life-Cycle Cost Evaluations

Life-cycle cost comparisons were developed based on the information presented in References 1, 10, 14, and 17. The life-cycle costs incorporate capital, operating, and maintenance costs over a defined planning period, and include inflationary effects. The use of life-cycle costs allows evaluation of different alternatives on an equal basis. The life-cycle costs are expressed as the net present value (NPV) of all the costs incurred during the planning period. The NPV is the amount of money that would need to be set aside today at a defined interest (discount) rate to fund the project or strategy.

No independent verification of the reference cost estimates was possible due to the summarized nature of the reports. Costs were escalated to current (December 2013) dollars using Engineering News Record's 20-City Construction Cost Index (ENRCCI). The following assumptions were used to develop the life-cycle cost comparisons:

- 25-year planning period.
- The baseline case water demand projection results in a need for an additional 13.7 mgd average production rate at the end of the planning period.
- A linear increase in the production rate occurs over the planning period.
- Discount rate of 6 percent, for consistency with value used in References 8 and 10.
- Inflation rate of 3 percent, for consistency with value used in References 8 and 10.

### Life Cycle Costs of Viable Strategies

Table 12 provides a summary of our analysis of the life-cycle costs of the viable strategies to meet future demands described above. The life-cycle and unit costs shown in Table 12 appear to be somewhat similar due to the programmatic nature of the MDWS analysis in Reference 10. All of the four strategies include common elements including backup wells, reservoirs, pipelines, booster pump stations, etc. The inclusion of the common elements tends to make all four options appear to have somewhat similar life-cycle costs and does not highlight the differences between the strategies. Our opinion of the implementation risk associated with each strategy highlights some of the differences associated with each strategy.

Table 12. Life-Cycle Costs of Viable Strategies to Meet Future Demands

| Strategy                                                  | Life-Cycle Cost, NPV | Unit Cost   | Opinion of Implementation Risk                                                                                                                       |
|-----------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eastward basal groundwater development                    | \$604 million        | \$9.67/kgal | Low, if legal issues can be resolved.                                                                                                                |
| Expand use of Na Wai Eha surface water                    | \$572 million        | \$9.15/kgal | Low, if water allocation can be obtained.                                                                                                            |
| Desalination of brackish groundwater                      | \$598 million        | \$9.57/kgal | High, due to energy price volatility and brine disposal challenges.                                                                                  |
| Maximization of recycled water use and water conservation | \$578 million        | \$9.25/kgal | Medium, some types of conservation measures are dependent on permanent behavioral changes before water savings can be safely allocated to new users. |

Note: kgal = 1,000 gallons

## Economic Impact of Losing Existing Surface Water Allocation

The MDWS currently treats an average of approximately 1.7 mgd of Na Wai Eha surface water at the Iao WTP, and has an agreement with WWC for up to 3.2 mgd of water from the Iao-Waikapu Ditch. The current treatment capacity of the Iao WTP is 2.3 mgd, but the process can be expanded to 3.2 mgd. The Iao WTP is the lowest cost surface water source for MDWS because the raw water ditch that feeds the WTP is located at an elevation that allows the membrane filtration system to be pressurized without pumping. Electricity costs to pressurize membrane processes are typically significant if the water must be pumped, but at the Iao WTP the membranes are pressurized for free by gravity. If MDWS were to lose its ability to obtain up to 3.2 mgd of Na Wai Eha surface water it would have to replace the capacity with other sources.

The life-cycle costs associated with the Iao WTP were evaluated to assess the impact of losing the water allocation. The life-cycle costs for the facility include capital, operation & maintenance costs and membrane replacement costs. The membranes typically require replacement at 7-year intervals and represent a significant recurring expenditure for membrane WTPs. Four membrane replacement cycles were included in the 25-year analysis. Table 13 provides a summary of the life-cycle costs for the facility for three separate future operating scenarios.

| Table 13. Iao WTP Life-Cycle Costs        |                 |              |
|-------------------------------------------|-----------------|--------------|
| Future Operating Scenario                 | Life-Cycle Cost | Unit Cost    |
| 1.7 mgd production (existing)             | \$21.5 million  | \$1.77 /kgal |
| 2.3 mgd production (existing capacity)    | \$32.5 million  | \$1.55 /kgal |
| 3.2 mgd production (full contract amount) | \$40.1 million  | \$1.37 /kgal |

If MDWS were to lose its ability to use up to 3.2 mgd of Na Wai Eha surface water it would need to replace the capacity and production with other, more expensive sources to meet the needs of its existing and future customers. The unit life-cycle costs for new sources were summarized in Table 12. Table 14 summarizes the significant potential economic impacts to MDWS if it lost the ability to treat Na Wai Eha surface water at the Iao WTP.

| Table 14. Economic Impact of Losing 3.2 mgd Surface Water Allocation |                                    |                          |                                    |
|----------------------------------------------------------------------|------------------------------------|--------------------------|------------------------------------|
| Future Operating Scenario                                            | Replacement Source Life-Cycle Cost | Iao WTP Life Cycle Value | Life-Cycle Economic Impact if Lost |
| 1.7 mgd production (existing)                                        | \$143 - \$150 million              | \$21.5 million           | \$116 million - \$123 million      |
| 2.3 mgd production (existing capacity)                               | \$194 - \$203 million              | \$32.5 million           | \$162 million - \$170 million      |
| 3.2 mgd production (full contract amount)                            | \$270 - \$282 million              | \$40.1 million           | \$230 million - \$242 million      |

## Economic Benefit of Increased Surface Water Allocation

MDWS will realize an economic benefit if a larger (up to 9.0 mgd) of Na Wai Eha surface water were made available for domestic use. Comparison of the life-cycle cost differences of the strategies listed in Table 13 shows that the economic benefit of being able to implement the strategy of expanding use of Na Wai Eha surface water is \$6 million to \$33 million depending on the higher-cost strategy that MDWS would otherwise implement.

Ms. Jennifer Oana, Deputy Corporation Counsel  
County of Maui  
December 27, 2013  
Page 13

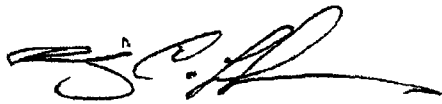
## Summary

MDWS will need to significantly increase its water production capacity in Central Maui to meet future customer needs. MDWS has identified four viable strategies to meet those needs. If MDWS were to lose its ability to treat up to 3.2 mgd of Na Wai Eha surface water the economic impact (loss) would be between \$116 million and \$242 million over a 25-year period. The economic benefit of a larger surface water allocation (up to 9.0 mgd) will be \$6 million to \$33 million over a 25-year period.

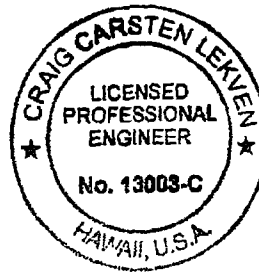
Brown and Caldwell appreciates that opportunity to assist you on this project. Should you have any questions, please do not hesitate to call me at 808-442-3301.

Very truly yours,

Brown and Caldwell



Craig C. Lekven, P.E.  
Supervising Engineer



EXP. 4/30/14

CCL:ic

## Limitations:

*This document was prepared solely for the County of Maui Department of the Corporation Counsel in accordance with professional standards at the time the services were performed and in accordance with the contract between the County of Maui Department of the Corporation Counsel and Brown and Caldwell dated November 19, 2013. This document is governed by the specific scope of work authorized by the County of Maui Department of the Corporation Counsel; It is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by County of Maui Department of the Corporation Counsel and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.*

# **Maui County Water Use and Development Plan**

## **Central DWS District Plan Update**

**November 16, 2010**

**EXHIBIT A**

# Table of Contents

|                                                                             |           |
|-----------------------------------------------------------------------------|-----------|
| <b>Table of Contents .....</b>                                              | <b>1</b>  |
| <b>Introduction .....</b>                                                   | <b>5</b>  |
| <b>Executive Summary.....</b>                                               | <b>6</b>  |
| SUMMARY OF RECOMMENDED CENTRAL DISTRICT PLAN .....                          | 7         |
| <b>Background and Context.....</b>                                          | <b>9</b>  |
| The Hawaii State Water Plan and the Water Use and Development Plan .....    | 9         |
| 1990 Water Use and Development Plan and 1992 Draft Update .....             | 9         |
| CWRM Framework .....                                                        | 9         |
| The Current Maui County Update of the WUDP .....                            | 9         |
| Final Candidate Strategies Report .....                                     | 10        |
| <b>Description of the Analytical Process .....</b>                          | <b>11</b> |
| <b>The Integrated Resource Planning Process .....</b>                       | <b>11</b> |
| Identification of Planning Objectives .....                                 | 12        |
| Characterization of Long Range Water Demand .....                           | 12        |
| Characterization of Specific Resource Options .....                         | 16        |
| Integrated Analysis of Candidate Strategies.....                            | 19        |
| Formulation and Analysis of Final Candidate Strategies .....                | 19        |
| <b>Independent Components Considered in All Strategies .....</b>            | <b>21</b> |
| <b>DWS System Measures .....</b>                                            | <b>21</b> |
| Demand-Side Management (Conservation) Programs .....                        | 21        |
| Supply-Side Leak Detection and Reduction Measures .....                     | 22        |
| Recycled Water Use Options .....                                            | 22        |
| Production Energy Efficiency Measures .....                                 | 23        |
| Potential Power Management Services .....                                   | 23        |
| Energy Production Options .....                                             | 23        |
| Water Rate Design and Pricing Policies .....                                | 23        |
| Exploratory / Investigative Measures .....                                  | 23        |
| <b>County - Wide Measures .....</b>                                         | <b>24</b> |
| Watershed Protection and Restoration .....                                  | 24        |
| Stream Restoration Measures .....                                           | 24        |
| Wellhead Protection Ordinance .....                                         | 24        |
| Well Development Policies and Regulation .....                              | 24        |
| Landscape Irrigation Efficiency Requirements .....                          | 25        |
| Drought Water Use Restrictions .....                                        | 25        |
| <b>Final Candidate Strategies.....</b>                                      | <b>26</b> |
| General Characterization of Central District Strategy Analysis .....        | 27        |
| System Reliability and Expansion Criteria .....                             | 27        |
| Iterative Analysis and Public Review .....                                  | 28        |
| <b>A. Northward Basal Groundwater .....</b>                                 | <b>30</b> |
| Summary .....                                                               | 30        |
| Project Design Scenarios .....                                              | 30        |
| Reference Strategy Versus Updated Northward Basal Groundwater Strategy..... | 30        |
| Policy and Feasibility Considerations .....                                 | 31        |
| Kahakuloa Valley Impacts.....                                               | 31        |
| Uncertain Hydrology .....                                                   | 32        |
| Economic Analysis .....                                                     | 32        |

|                                                                                    |           |
|------------------------------------------------------------------------------------|-----------|
| <b>B. Eastward Basal Groundwater .....</b>                                         | <b>33</b> |
| Summary .....                                                                      | 33        |
| Project Design Scenarios.....                                                      | 34        |
| Well Field Location: Haiku vs. Honopou vs. Waikamoi .....                          | 34        |
| Lowrie Ditch Water Transmission Scenario .....                                     | 34        |
| Interconnection Between Central and Upcountry District Water Systems .....         | 35        |
| Policy and Feasibility Considerations .....                                        | 36        |
| Compliance with EMPLAN Consent Decree .....                                        | 36        |
| Potential Impacts of Groundwater Pumping on Existing Wells, Springs and Uses ..... | 37        |
| Acceptance by East Aquifer Area Residents .....                                    | 37        |
| Efficacy and Water Quality of Wells at 1000-Foot Elevation.....                    | 38        |
| Capital Cost Financing .....                                                       | 38        |
| Economic Analysis .....                                                            | 38        |
| Alternate Eastward Basal Groundwater Strategies.....                               | 40        |
| <b>C. Na Wai Eha Surface Water Treatment .....</b>                                 | <b>43</b> |
| Summary .....                                                                      | 43        |
| Treatment Plant and Reservoir System Alternatives .....                            | 43        |
| Treatment Plant Location .....                                                     | 43        |
| Assurance of Long-Term Availability of Source Water .....                          | 44        |
| Source Water Cost .....                                                            | 45        |
| Base Steam Flow Operation vs Raw Water Reservoir Storage .....                     | 45        |
| Reservoir System Design and Operation Objectives .....                             | 46        |
| Project Financing Alternatives .....                                               | 47        |
| Project Design, Construction, Ownership and Operation -- DWS vs Developer....      | 47        |
| Project Capitalization .....                                                       | 47        |
| Policy and Feasibility Considerations .....                                        | 47        |
| Water Allocation Issues .....                                                      | 47        |
| Capitalization, Credits and Entitlements .....                                     | 49        |
| Reservoir Land Use and Land Acquisition .....                                      | 51        |
| Non-Point Source Pollution in Developed and Urbanized Areas .....                  | 51        |
| Environmental Impacts .....                                                        | 51        |
| Economic Analysis.....                                                             | 51        |
| Alternate WTP Locations and Source Water Costs .....                               | 53        |
| Analysis of Reservoir System to Capture High Stage Stream Flows .....              | 58        |
| <b>D. Desalination of Brackish Groundwater .....</b>                               | <b>67</b> |
| Summary .....                                                                      | 67        |
| Project Design Scenarios .....                                                     | 67        |
| Policy and Feasibility Considerations .....                                        | 67        |
| Economic Analysis .....                                                            | 68        |
| <b>E. Extensive Conservation and Wastewater Recycling .....</b>                    | <b>69</b> |
| Summary .....                                                                      | 69        |
| Project Design Scenarios .....                                                     | 69        |
| Wastewater Recycling Options .....                                                 | 69        |
| Water Conservation Program Options .....                                           | 70        |
| Policy and Feasibility Considerations .....                                        | 71        |
| Economic Analysis.....                                                             | 71        |
| SUPPLEMENTAL ANALYSIS OF DEM R-1 RECYCLED WATER OPTIONS .....                      | 75        |
| Policy and Feasibility Considerations .....                                        | 75        |
| Economic Analysis .....                                                            | 76        |
| <b>Comparison of Final Candidate Strategies .....</b>                              | <b>82</b> |
| Planning Objectives and Attributes Matrix .....                                    | 82        |
| Economic Analysis of the Final Candidate Strategies .....                          | 91        |

|                                                                                    |            |
|------------------------------------------------------------------------------------|------------|
| Comparison of the Merits of the Final Candidate Strategies .....                   | 99         |
| Uncertainty and Contingency Planning .....                                         | 100        |
| Uncertainty Regarding the Viability of Strategies .....                            | 100        |
| Timing of Need for the Next Discretionary Resource .....                           | 100        |
| Uncertainty Regarding Energy Prices .....                                          | 102        |
| Uncertainty Regarding Project Construction Costs .....                             | 102        |
| Capital Costs and Uncertainty in Future Water Demand .....                         | 103        |
| <b>Central DWS District Plan .....</b>                                             | <b>104</b> |
| Short-Term Resources .....                                                         | 104        |
| Long-Term Resources .....                                                          | 105        |
| Regulatory Mechanisms .....                                                        | 108        |
| Resource Protection and Restoration .....                                          | 109        |
| Watershed protection and restoration .....                                         | 110        |
| Wellhead protection .....                                                          | 110        |
| Stream restoration .....                                                           | 110        |
| Protection of Cultural Resources .....                                             | 110        |
| Energy Efficiency and Energy Production .....                                      | 110        |
| Water Allocation Policies .....                                                    | 111        |
| Venues and Purposes for Allocations .....                                          | 112        |
| Hierarchy of Priorities .....                                                      | 113        |
| Set-Asides .....                                                                   | 114        |
| Allocations of Specific Water Sources to Land Use .....                            | 115        |
| Statements of Allocation Policies .....                                            | 115        |
| <b>Appendix A - Analysis of Conservation Program Portfolios .....</b>              | <b>116</b> |
| Demand Side Management (Conservation) Programs .....                               | 116        |
| Characterization and Evaluation of Individual DSM Measures .....                   | 116        |
| Preliminary Analysis of Candidate DSM Programs .....                               | 116        |
| Characterization of Water End-Uses by District .....                               | 117        |
| Estimate of DSM Technical Potential .....                                          | 118        |
| Estimate and Analysis of DSM Economic Potential .....                              | 118        |
| Analysis of Magnitude and Pacing of DSM Programs .....                             | 119        |
| Independent Expert Review of DSM Analysis and Program Design .....                 | 122        |
| Specific DSM Program Design and Contracting .....                                  | 123        |
| <b>Appendix B - Characterization of Central District Specific Resource Options</b> |            |
| <b>Committed Resource Options .....</b>                                            | <b>1</b>   |
| Option (Committed): Kupaa Well .....                                               | 1          |
| Option (Committed): Waikapu Tank Site Well .....                                   | 2          |
| Option (Committed): Iao Tank Site Well .....                                       | 2          |
| Option (Committed): Maui Lani Wells .....                                          | 2          |
| Tables Characterizing Committed Resource Options .....                             | 2          |
| <b>Short-Term Resource Options .....</b>                                           | <b>8</b>   |
| Option (Short-Term): Waikapu South Wells .....                                     | 8          |
| Option (Short-Term): Backup Well at Existing Well Site .....                       | 8          |
| Option (Short-Term): Shaft 33 Replacement Well .....                               | 8          |
| <b>Long-Term Resource Options .....</b>                                            | <b>13</b>  |
| Ground Water Production Options .....                                              | 13         |
| Option (Long-Term): North Waihee Aquifer Wells .....                               | 13         |
| Option (Long-Term): Kahakuloa Aquifer Wells .....                                  | 13         |
| Option (Long-Term): Haiku Aquifer Wells .....                                      | 14         |
| Option (Long-Term): Honopou Aquifer Wells .....                                    | 14         |

|                                                                          |    |
|--------------------------------------------------------------------------|----|
| Option (Long-Term): Waikamoi Aquifer Wells .....                         | 14 |
| Option (Long-Term): Waikamoi Aquifer Wells with Ditch Transmission ..... | 15 |
| Option (Long-Term): Brackish Water and Seawater Desalination .....       | 15 |
| Tables Characterizing Long-Term Ground Water Production Options .....    | 15 |
| Surface Water Treatment Options .....                                    | 29 |
| Option (Long-Term): Waiale Water Treatment Plant .....                   | 29 |
| Option (Long-Term): Waihee Water Treatment Plant .....                   | 29 |
| Option (Long-Term): Iao Stream "Flash" Water Storage .....               | 29 |
| Tables Characterizing Long Term Surface Water Treatment Options .....    | 30 |
| Water Reclamation / Recycling Options .....                              | 39 |

# Introduction

The Central DWS District Plan Update is one component of a comprehensive update to the Maui County Water Use and Development Plan (WUDP). The Central DWS District Plan Update focuses on identifying the resources and actions to be implemented in conjunction with providing water services provided by the Maui County Department of Water Supply in the DWS Central District. Several forthcoming components of the WUDP update will address DWS services in other districts, services provided by non-DWS water purveyors, other water uses and general island-wide and county-wide issues.

The Central DWS District Plan Update is supported by several documents available for download from the Maui County Department of Water Supply (DWS) web site.<sup>1</sup> All documents remain in the form of "drafts" pending agency approval of the WUDP.

Water Use and Demand -- Department of Water Supply Systems (Draft), May 1, 2007

DWS Finance and System Economics (Draft), August 23, 2005

Resource Options (Draft), May 15, 2007

Candidate Strategies -- Central District Preliminary Draft, September 2006

Central District Final Candidate Strategies Report (Draft), June 17, 2009

Central District Final Candidate Strategies Report Appendix B: Characterization of Central District Specific Resource Options, November 27, 2009

---

1. Documents are available for download at the County of Maui web site at the following page: Department of Water Supply | Departments | Department of Water Supply | Resources and Planning Division | Water Use and Development Plan | Draft Water Use and Development Plan Chapters. As of the date of publication of this draft report the URL for this download page is: <http://himauicounty.civicplus.com/index.asp?NID=767>

## Executive Summary

The WUDP update is prepared in accordance with the CWRM "Statewide Framework for Updating the Hawaii Water Plan". An "integrated resource planning" approach is used which includes identifying planning objectives, determining future water needs, identifying all feasible means to meet future water needs and determining, by careful analysis, the best strategy to meet the planning objectives and future needs.

The planning objectives for the Central District include a broad range of considerations including water service availability, reliability, quality, cost and broader considerations including protection of streams, water resources, cultural resources, sustainability, fairness, viability, and conformance with general and community plans. Strategies to meet future water needs were evaluated with respect to each of the planning objectives. Several programs and "resources" were incorporated into the strategies to address particular objectives as necessary.

Future water needs for the Central District were projected based on the planning assumptions currently being used in the preparation of the Maui general, island and community plan updates. A range of high, base, and low water projections was developed to address uncertainty in future water demand. Water consumption for the DWS Central District system is expected to grow from 22 million gallons per day (MGD) in 2005 to 34 MGD in 2030 (base case). Water production requirements are higher than consumption requirements by about ten percent to account for unmetered uses (such as fire protection and line flushing) and system losses.

A wide range of possible "resource options" was identified and considered. These included various options to provide new sources of water, options to conserve and use water more efficiently and options to protect stream and groundwater resources.

The most promising resource options were examined in detail using an integrated capacity expansion and production cost simulation model. This analysis tool evaluates various combinations of resources (candidate strategies) in the context of operation of the overall Central District water system.

The most promising candidate strategies (*Final Candidate Strategies*) were investigated, characterized and analyzed in greater detail. This is the subject of this report.

The *Final Candidate Strategies* presented in this report are:

- A. Northward Basal Groundwater Well Development
- B. Eastward Basal Groundwater Well Development
- C. Na Wai Eha Surface Water Treatment
- D. Desalination of Brackish Groundwater
- E. Maximization of Water Conservation and Recycled Wastewater Use

As explained in this report, each of these strategies was examined in detail to determine possible policy issues, implementation variations, costs and impacts. The strategies were compared to one another regarding each of the planning objectives. Uncertainties regarding the pace of growth in water demand, future energy costs and the viability of the strategies were analyzed and considered. Based on all of the analyses and considerations, a Recommended Central District Plan was developed that comprises the proposed draft Central District Plan. This plan features the following principal recommendations:

## **SUMMARY OF RECOMMENDED CENTRAL DISTRICT PLAN**

### **SHORT-TERM RESOURCES**

- Diligently acquire the committed and near-term supply resources that are currently planned and underway.
- Optimize production from existing resources.
- Continue and accelerate leak detection and repair programs.
- Explore demand response options.

### **LONG TERM RESOURCE ACQUISITION**

- Monitor Na Wai Eha surface water proceedings.
- Proceed with WTP negotiations and approvals to the extent possible pending determination of assurance of long-term water availability and price.
- Consider alternate WTP locations and raw water storage reservoir configurations.
- Implement programmatic conservation measures.
- Substantially expand use of Kihei R-1 recycled wastewater to displace demand for potable water supply.
- Monitor ongoing feasibility and preserve options of other long-term strategies.

### **REGULATORY MECHANISMS**

- Maintain and/or extend inverted-block and progressive rate designs.
- Review system expansion financing policies and/or establish sufficient system development fees.
- Establish water source development contract standards.
- Establish clear, meaningful criteria for determining availability of water and need for new system supply resources.

### **RESOURCE PROTECTION AND RESTORATION**

#### **Watershed Protection and Restoration**

- Support watershed partnership agreements.
- Support reforestation programs.

#### **Wellhead Protection**

- Implement a wellhead/aquifer protection ordinance for each island.

#### **Stream Restoration**

- Support appropriate amendment of interim and/or permanent instream flow standards by the CWRM.
- Support programs to protect and restore streams.
- Consider impacts on reliance on water from streams in County land use determinations.

#### **Protection of Cultural Resources**

- Support stream restoration measures.
- Consult with Burial Council and local kuleana representatives regarding DWS actions.

## ENERGY EFFICIENCY AND ENERGY PRODUCTION

Establish a DWS Energy Resource Coordinator position.

Identify and implement energy efficiency opportunities.

Identify and implement load management opportunities.

Identify and implement energy generation opportunities.

## WATER ALLOCATION POLICIES

This section of the Recommended Central District Plan includes a discussion of the following subjects and possible approaches to establish water allocation policies:

Venues and Purposes for Allocations

Hierarchy of Priorities

Set-Asides

Allocations of Specific Water Sources to Land Use

Statements of Allocation Policies

# Final Candidate Strategies

In previous analyses, presentations and reports, various strategies were considered to meet the planning objectives for the DWS Central District. The "Final Candidate Strategies" for the Central District represent five fundamental alternative approaches to meet projected water needs for the twenty-five-year planning period. Each strategy is distinguished by a different featured major approach to meeting new water needs:

- **A. Northward Basal Groundwater Well Development**
- **B. Eastward Basal Groundwater Well Development**
- **C. Na Wai Eha Surface Water Treatment**
- **D. Desalination of Brackish Groundwater**
- **E. Maximization of Water Conservation and Recycled Wastewater Use**

In addition to these distinguishing features there are many components that are included in all the strategies. These include:

- **Existing Resources** -- Resources that are currently part of the DWS Central District system<sup>2</sup>
- **Committed and Near-Term Resources** -- New supply resources that are already in the process of acquisition, development or construction<sup>3</sup>
  - Maui Lani Wells (2010)
  - Kupaa Well (2010)
  - Iao Tank Site Well (2010)
  - Waikapu Tank Well (2010)
  - Waikapu South Wells (2011 and 2012)
- **Demand-Side Management (Water Conservation) Programs** -- Based on previous and updated analysis, a water conservation program is included in all strategies. The programs are designed to attain 15 percent of Central District technical conservation potential in a period of five years.<sup>4</sup>
- **Independent Components Considered in All Strategies** -- A list of independent resources and plan components that could be implemented in any of the Final Candidate Strategies was described in an earlier section of this report. It is presumed that these components would be included in any of the strategies but are not explicitly

---

2. Several wells are planned in the vicinity of the existing Wailuku Shaft 33 well. These wells would replace the Shaft 33 well, which would then be retired. In the analyses it is assumed that these wells would replace the existing capacity and production of the Wailuku Shaft 33 well but would not add any new or additional capacity or production capability.

3. The dates assumed in the integration analyses supporting this report are earlier based on previous estimates of project completion dates. The use of earlier dates in the analyses underestimates the degree of shortfall in water system capacity standards in the next couple of years but does not affect later years or otherwise perturb the analysis of the Final Candidate Strategies. There is some possibility that one or more of these resources may be located at different locations in the Iao and Waikapu aquifers or may be constructed by non-DWS developers. Regardless of the specific location or developer, the general assumption in the analysis is that well capacity and limited water production capability will be developed in this general area to meet the projected Central District water demands.

4. In one Final Candidate Strategy, "Maximization of Water Conservation and Recycled Wastewater Use," more intensive conservation programs are included designed to reach 45 percent of technical conservation potential in a period of ten years.

evaluated in the economic analyses or considered in the comparisons between the Final Candidate Strategies.

### **General Characterization of Central District Strategy Analysis**

All of the strategies are designed to meet the water needs of the Central District for the twenty-five-year planning period. Water need projections are based on the base case demographic projections that were prepared for and are being used in the current update of the Maui County General, Island and Community Plans.<sup>5</sup>

#### **System Reliability and Expansion Criteria**

In order to make meaningful comparisons of the economics of diverse resource strategies, it is necessary to apply system design reliability standards that are meaningful, consistent, specific and explicit. The objective of the economic analysis is to compare different approaches to providing water supply to meet projected needs over the planning period at a standard and consistent level of service reliability.

In order to ensure that sufficient and uniform water service capability and reliability is maintained it is necessary to consider two design criteria. First, it is necessary to maintain sufficient water sources to provide the amount of water required (water production capability). Second, it is necessary to maintain sufficient equipment and infrastructure redundancy to meet maximum production flow requirements even if some equipment is out of service (system capacity). The timing of the need for additional resources is determined considering both of these criteria. Regarding both criteria, it is prudent for purposes of long-range planning and economic analyses to apply some conservative assumptions to account for uncertainties regarding efficacy of resources and possible delays in implementation.

The water production capability of the existing Central System is modeled assuming that the Iao aquifer basal groundwater withdrawals are limited to 16 MGD (equal to 80% of the 20 MGD sustainable yield). This assumed level of production is lower than the currently permitted rate of withdrawal and provides an appropriate margin of conservatism to account for planning uncertainties.

The sufficiency of the system capacity of the Central District system is determined according to DWS system design reliability standards with some modifications.<sup>6</sup> The modified system design reliability standards are used in conjunction with maintaining sufficient water production capability to determine the dates that additional resources are necessary to ensure that the strategies provide sufficient and comparable levels of service reliability.

Currently the DWS Central System is deficient with respect to meeting system design capacity standards. The addition of the committed and near-term resources identified above is necessary as soon as possible. With the addition of these resources, however, the DWS would have sufficient water production capacity and capability to serve its needs until the year 2012.<sup>7</sup> With the

---

5. Water demand projections are documented in detail in the *Water Use and Demand -- Department of Water Supply Systems* chapter, May 2007. These projections are based on the demographic projections in the Maui County Planning Department *Socio-Economic Forecast*, June 2006.

6. The system design standards used for planning purposes in the capacity expansion and production cost model used in the analyses presented in this section are a modification of the system standards for groundwater resources adopted collectively by the Hawaii county water departments. The standards applied here provide that sufficient installed well capacity must be maintained to supply the system day capacity (1.5 times average annual metered consumption) in sixteen hours of pumping (using two-thirds of installed pumping capacity). Surface water resources are assumed to contribute to system reliable capacity based on the Department of Health capacity deration based on allowed filtration flux with one filter train out of service.

addition of the DSM water conservation programs included in each of the Final Candidate Strategies, the next discretionary resource addition would be needed in the year 2013. Each of the final candidate resource strategies provides for the addition of new capacity by the year 2013.

### **Iterative Analysis and Public Review**

The analyses supporting this report were conducted in several iterative rounds.

- First Round -- Presented to the Water Advisory Committee on January 8, 2008
  - Resources characterized in the Candidate Strategies report were configured into more completely integrated strategies.
  - Characterization of the resource option components were updated. This included updating and refinement of energy costs, project capital costs and expected well yields.
  - Conservation, wastewater recycling and raw water storage reservoir options were examined in more detail.
- Second Round -- Presented to the Water Advisory Committee on July 23, 2008
  - Comments received in presentations of the first round analyses to the DWS staff, the CWRM and the Maui County Board of Water Supply were incorporated.
  - Water conservation program characterization and analysis were refined. A DSM program design consultant was retained to review the analysis methods and assumptions and to make recommendations for a portfolio of conservation programs for the Maui districts.
  - Additional options and scenarios were examined, including expanded raw water storage reservoir scenarios, reconfiguration and optimization of the Eastward Basal Groundwater scenarios and a scenario incorporating ditch transport of water from East Maui to the Central District system.
  - The Northward Basal Groundwater Strategy was reconfigured based on updated information regarding the hydrology and expected well yields.
  - Recent higher energy costs were incorporated in the economic analysis.
  - Capital cost and depreciation accounting methods were refined.
  - A fifty-year economic study period was added to supplement the twenty-five year planning period. This was provided to more thoroughly account for the long-term operation cost benefits of some of the more capital-intensive resource options (large water storage reservoirs and major water transmission systems)
- Third Round -- Transmitted to the BWS for public hearing, review and recommendations
  - Economic analysis was presented for a range of possible future energy costs.
  - Strategies were refined based on updated information, comments received and ongoing review.
  - The "Reference Strategy" from previous analyses was retained as a basis for economic comparisons, but the reconfigured and updated Northward

---

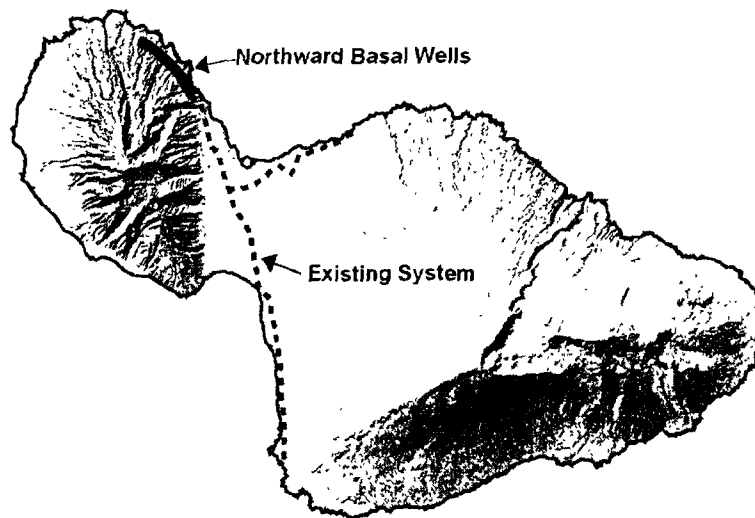
7. For a discussion of the characterization of the dates additional resources are needed, see the section later in this report titled "Uncertainty and Contingency Planning".

Basal Groundwater strategy resources were incorporated uniformly as follow-up resources in all strategies that require additional capacity towards the end of the planning period.

- Additional scenarios were examined based on Water Advisory Group requests.
- Optimization of the strategy configurations was re-examined based on the most recent assumptions.
- Fourth Round -- Presented in this Central District Plan Update
  - Analysis and recommendations were amended to incorporate results of the previously recommended study to examine and verify the feasibility of DEM Kihei WWTP R-1 recycled water options.
  - Text and recommendations were amended to consider updated circumstances including amendment of IIFS for Na Wai Eha streams.
  - Text was amended to reflect status of document as a plan update (rather than a review draft report).
  - Text and recommendations were amended as recommended by the DWS to incorporate public comment and BWS recommendations.
  - Amendments were incorporated as approved by the Council of the County of Maui.

A description of several more specific considerations and scenarios examined in the progressive rounds of analysis is provided in the discussion of the economic analysis for each of the Final Candidate Strategies below.

In addition to the features and components explicitly considered in the analysis of the Final Candidate Strategies, there are several independent components (described in a section below) that can be considered for implementation with any of the Final Candidate Strategies. These include measures that address county-wide planning objectives as well as measures to address DWS system objectives. For discussion of the independent components refer to the section above: *Independent Components Considered in All Strategies*.



## **A. Northward Basal Groundwater**

### **Summary**

This strategy features a series of basal groundwater wells located north of the current extent of the DWS Central District system in the north side of the Waihee aquifer and the Kahakuloa aquifer. The first phase of this strategy would be a substantial investment in water transmission across Makamakaole Gulch. The strategy would proceed in phases extending northward with additional wells with associated transmission, storage tanks and booster pumps:

All of the implementations of this strategy include a "basic" Demand-Side Management program that is designed to attain 15% of the water efficiency technical potential in a period of five years.<sup>8</sup>

### **Project Design Scenarios**

Several project design alternatives were explored including variations in project extent, well locations and the number, size and expected yield of wells.

### **Reference Strategy Versus Updated Northward Basal Groundwater Strategy**

An initial characterization of a northward basal well development strategy was used as the reference strategy in the previous candidate strategies analysis reported in the *Candidate Strategies Central District Preliminary Draft*, September 12, 2006. This strategy was selected as a reference strategy in that report because it is comprised of a series of incremental capacity additions which makes it a good basis for comparison with other strategies. The other strategies feature a single large capacity addition (such as a water treatment plant or very large transmission line) as a dominant capital expenditure.

The original reference strategy has been maintained as a reference strategy in the presentations of the economics of the Final Candidate Strategies. The reference strategy is not, however, one of the Final Candidate Strategies. The Northward Basal Groundwater strategy has been re-char-

8. The DSM program portfolio included in each of the Final Candidate Strategies is described in a separate section on this subject and in Appendix A.

acterized based on updated information about hydrology and expected well yield in the northern half of the Waihee aquifer and the Kahakuloa aquifer.

The initial reference strategy included three new wells in the northern half of the Waihee aquifer and three wells in the Kahakuloa aquifer. The revised Northward Basal Groundwater strategy includes twice as many, much smaller wells than the reference strategy and assumes costs that have been updated with more recent information. The revised Northward strategy is more expensive due to higher estimated project costs and lower expected production capability.<sup>9</sup>

To summarize, in the analyses presented in this report, the original reference strategy is still used as the zero point against which differences in strategy costs are compared but is not one of the Final Candidate Strategies. The Northward “reconfigured” Basal Groundwater strategy is also included for reference in the economic analyses and is one of the Final Candidate Strategies.

The final version of the Northward Basal Groundwater strategy is comprised of a series of phases extending northward with additional wells with associated transmission, storage tanks and booster pumps:<sup>10</sup>

- Maluhia (2) 500 GPM Wells -- North Waihee Aquifer, North of Makamakaole Gulch
- Wailena (2) 500 GPM Wells -- North Waihee Aquifer, Extending Further North
- Waipili (2) 500 GPM Wells -- North Waihee Aquifer, Extending Further North
- Kahakuloa (4) 500 GPM Wells -- Kahakuloa Aquifer, North of Kahakuloa Valley
- Waihali (2) 500 GPM Wells -- Kahakuloa Aquifer, Extending Further North
- Poelua (4) 500 GPM Wells -- Kahakuloa Aquifer, Extending Further North

Each of these phases is characterized in detail in Appendix B.

The sustainable yield of the Waihee aquifer is 8 MGD. The Northward basal well strategy assumes that 6.8 MGD would be withdrawn from this aquifer (85% of sustainable yield) including new and existing wells.

The sustainable yield of the Kahakuloa aquifer was lowered in the recent revision of the CWRM Water Resource Protection Plan (WRPP) from 8 MGD to 5 MGD. The WRPP states that the expected sustainable yield from this aquifer is uncertain and within a range of 5 MGD to 8 MGD. The Northward Basal Groundwater strategy assumes that 4.8 MGD would be withdrawn from this aquifer.

## **Policy and Feasibility Considerations**

### **Kahakuloa Valley Impacts**

This strategy would transport water from the Kahakuloa aquifer for Central District use. Although there would be no wells in the Kahakuloa valley there may be concerns from local residents. Impacts in the valley would include installation of the water transmission line, access roads and power lines. County water service could be made possible to the Kahakuloa Valley with this

---

9. In the first two rounds of analysis of the Final Candidate Strategies, the reference strategy wells were also assumed to be implemented as follow-up resources in the other strategies when additional capacity or water production was required after implementation of the featured resources. In the analysis presented in this report any follow-up resources that are required are consistent with the revised Northward Basal Well strategy.

10. The names of most of the phases of the Northward Basal Groundwater strategy are changed from the previous Candidate Strategies report to reflect the fact that these are different well configurations and in order to more accurately match the place names of the vicinities of the areas the wells could be sited. No specific sites were identified in the analyses.

strategy. This strategy has not been presented to or reviewed by Kahakuloa area residents. Prior to any commitment to this strategy there should be outreach to provide information to and hear concerns from Kahakuloa Valley residents.

### **Uncertain Hydrology**

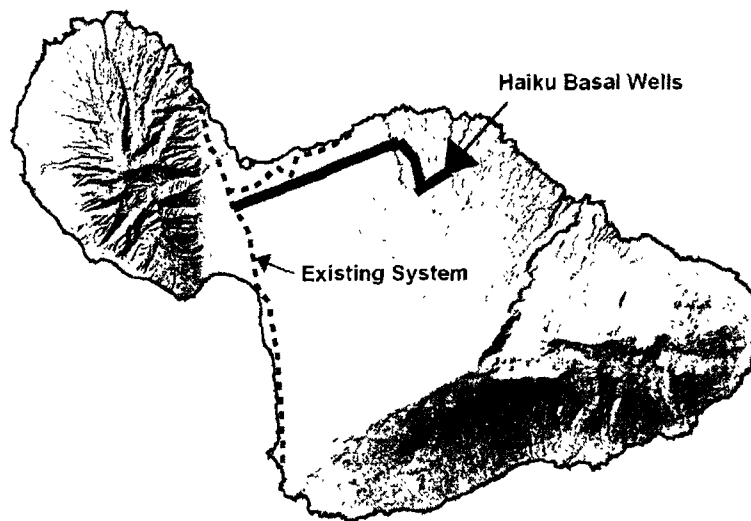
The hydrology of the North Waihee aquifer and the Kahakuloa aquifer is not well investigated and the productivity of wells in this area is unproven. Well efficacy should be demonstrated prior to substantial investments in transmission across Makamakaole Gulch.

As noted above, the sustainable yield of the Kahakuloa groundwater aquifer was recently lowered from 8 MGD to 5 MGD. Modeling being performed by the USGS indicates that the fresh-water lens of this aquifer is likely to be thinner than in the Iao and southern Waihee aquifer areas. This aquifer is therefore less promising for high-production large-capacity wells.

### **Economic Analysis**

Economic analysis of this strategy was presented in the *Candidate Strategies* chapter and previous presentations to the Water Advisory Committee. The updated economic analysis of this strategy is presented in this report in the section below comparing the final resource strategies.

In all of the charts showing the results of the economic analyses presented in this report the original Northward Basal Groundwater strategy presented in the *Candidate Strategies* chapter is maintained as the "Reference Strategy" providing the "zero point" for the comparative economic charts. The reconfigured Northward Basal Groundwater Final Candidate Strategy is also included for reference in all of the comparative economic charts.



## **B. Eastward Basal Groundwater**

### **Summary**

This strategy features a series of new basal groundwater wells in the Haiku groundwater aquifer with water transmission to the DWS Central District system. As discussed below, several alternate configurations of this strategy were considered and analyzed but were rejected in favor of the Haiku aquifer strategy. Other configurations considered included transmission and development of wells in the Honopou and Waikamoi aquifers and use of the Lowrie Ditch to transmit water to the central Maui area.

Interconnection of the Central District and Upcountry District water systems was also considered and is discussed in this section. Since the development of a Haiku aquifer wellfield for the Central District would provide close proximity of major transmission components of these two water systems, interconnection could provide benefits to each system if the Haiku strategy were implemented. Interconnection in and of itself, however, does not provide a solution to the needs of the two water systems without development of new water sources.

All of the implementations of this strategy include a "basic" Demand-Side Management program that is designed to attain 15% of the water efficiency technical potential in a period of five years.<sup>11</sup>

The Eastward Basal Groundwater strategy is an expensive strategy because of the capital costs associated with the necessary transmission improvements and because energy requirements for pumping would be relatively high because of the elevation of the wells. Organized opposition to wells in the Haiku aquifer in the past led to litigation and a Consent Decree. As discussed below, several terms of the Consent Decree would have to be met before this strategy could be implemented.

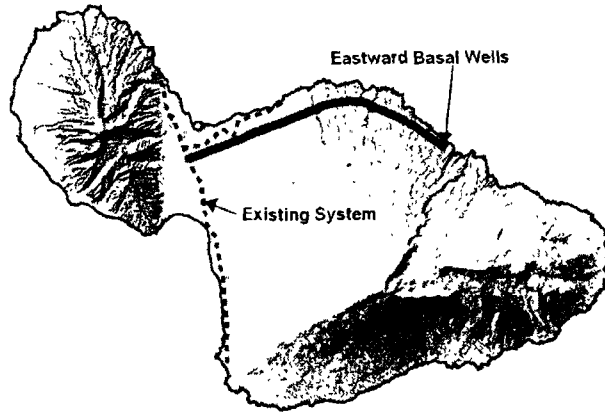
---

11. The DSM program included in each of the Final Candidate Strategies is described in a separate section on this subject and in Appendix A.

## **Project Design Scenarios**

### **Well Field Location: Haiku vs. Honopou vs. Waikamoi**

Several variations of this strategy were analyzed to determine the optimum location for wells. An initial round of analyses was conducted to determine whether it was more economical to locate wells in the Haiku aquifer or further east in the Honopou aquifer. Wells in the Haiku aquifer would need to be located at sufficient elevation to stay above groundwater contamination from historical and existing land uses. Wells at the higher elevation require additional costs to pump water. Wells located in the Honopou aquifer would require additional transmission system costs but could be located at a lower elevation and save long-term pumping power costs. The initial analysis compared Haiku wells located at 1500-foot elevation with wells located further east in the Honopou aquifer at an elevation of 600 feet.<sup>12</sup>



As a result of comments received from the DWS and the Central District Water Advisory Committee a second round of analyses was conducted with several modifications. The elevation of the wells in the Haiku area scenario was changed to 1000 feet to be consistent with the minimum elevation necessary to avoid groundwater contamination. The Honopou scenario was changed in several significant ways. First, the number and size of the wells was changed in consideration of the expected characteristics of the groundwater hydrology. Lower yields are expected from each well than was assumed in the initial analyses. A larger number of smaller wells was configured. Second, the well locations were moved further east to the Waikamoi aquifer in order to avoid drilling new wells above the existing wells and springs currently in use by Honopou residents. Third, costs of the water transmission system were updated based on more recent information.

### **Lowrie Ditch Water Transmission Scenario**

In response to a suggestion made by a member of the Water Advisory Committee, an additional analysis was conducted to determine the economics of using the Lowrie ditch to transport water to the Central Maui area rather than the expensive transmission line. In this scenario, water from the wells would be pumped into the Lowrie ditch at approximately 600-foot elevation. Water would be taken from the ditch downstream eliminating a substantial length of new transmission pipe but requiring construction and operation of a water treatment plant to bring the water to potable standards.

The Lowrie Ditch is privately owned by HC&S and currently used for the transportation of irrigation water. Utilization of the ditch for transportation of water for public municipal purposes would require an agreement with HC&S.<sup>13</sup>

12. A 600-foot wellhead elevation was analyzed because it provides approximately the minimum elevation to provide sufficient pressure to flow to the pressure gradient of the distant Central Maui DWS system.

13. This analysis was a prospective economic feasibility analysis. There was no verification of the capacity of the Lowrie Ditch to accommodate assumed additional water flow and no specific institutional or contractual issues were examined.

## **Interconnection Between Central and Upcountry District Water Systems**

Interconnecting the Central DWS water system with the Upcountry DWS water system could provide benefits to the reliability and operation economics of one or both systems. The costs and benefits of interconnection of these systems were considered in the analysis of the Candidate Strategies. In particular the possibilities of (1) alternate uses of the Hamakuapoko wells, (2) expansion and interconnection of the Kamole Water Treatment Plant with the Central system and (3) dual purpose service of the East Maui basal well expansion strategy were considered. It was determined that each of these interconnection options provided some benefits, but none provided sufficient supplemental benefits to serve as the fundamental basis for a Final Candidate Strategy.

### **HAMAKUAPOKO WELLS**

The Hamakuapoko wells are prohibited by county ordinance from serving potable uses. These wells could provide water to the EMI Hamakua ditch, possibly in trade for raw ditch water withdrawn by the DWS at other locations and/or times. This trading arrangement could provide additional potable production capability to the extent that it would allow the DWS to withdraw additional raw water from the EMI ditch system for either treatment for potable use or to displace use of existing uses of DWS potable water for irrigation uses. This option is potentially valuable as a reliability contingency measure during times of drought when Wailoa/Hamakua ditch flows are restricted, but it is not otherwise cost-effective due to the costs of pumping the basal groundwater from the Hamakuapoko wells to the elevation of the Hamakua ditch. This option would not provide sufficient additional effective water source to serve as the fundamental basis for a Final Candidate Strategy.

### **EXPANSION AND INTERCONNECTION OF THE KAMOLE WATER TREATMENT PLANT**

Expansion and interconnection of the Kamole Water Treatment Plant with the Central system could provide a limited amount of additional redundancy of production equipment for the Central system and the Upcountry system (with the addition of sufficient additional booster pumps). The amount of this contribution is limited, however, because there would be some extended periods of time when all available source water to the Kamole WTP would be needed for existing source needs for the Upcountry system.

Some economic benefit would also result during times that ample water is available in the Wailoa ditch (supplying the Kamole WTP) that could serve the Central system and displace more expensive Central system resources. The costs of expanding the Kamole WTP, however, exceed these system operation efficiency benefits (even without considering the costs of necessary interconnecting transmission improvements).

Because the amount of water available to the DWS is ultimately limited by the flows in the Wailoa ditch and this capacity is currently relied upon to meet existing and future needs of the Upcountry system, this option would not provide any substantial additional new water sources that would effectively meet new water demands on either system.

Interconnection of the Kamole WTP with the Central District system would require an agreement with HC&S. One important consideration for any expansion of capacity for the Kamole WTP is the potential reduction in Wailoa Ditch stream flow which may result from pending actions to investigate and amend the interim instream flow standards for the East Maui streams that provide water to the ditch system.

### **DUAL PURPOSE SERVICE OF HAIKU AQUIFER BASAL WELLS**

One of the Final Candidate Strategies for the DWS Central District is development of a series of wells at approximately 1000-foot elevation in the Haiku aquifer with new transmission to the Central system. Implementation of this strategy would provide a relatively inexpensive means to

interconnect the Central and Upcountry systems due to the proximity of substantial capacity transmission piping.

Interconnection could provide a limited amount of additional redundancy of production equipment for the Upcountry system with the addition of sufficient additional booster pumps. This is of limited value, however, since the Upcountry system is not limited by equipment redundancy but is limited instead by drought period source water availability. New resources planned for the Upcountry system are necessary to provide a reliable source of water during times of low production capability of the surface water sources during periods of drought. With the exception of booster pump capacity, the Upcountry system already has sufficient equipment capacity redundancy.

Interconnection would not provide substantial new drought period source water capability for the Upcountry system. The Haiku wells are relied upon in the Central District strategies to provide new effective source water production for the Central system. For periods of short duration, other water sources on the Central system could provide supplemental production to make up for water that would be required from the Haiku wells to meet upcountry needs. This would not be possible, however, for moderate or extended drought periods which typically last several months per year.

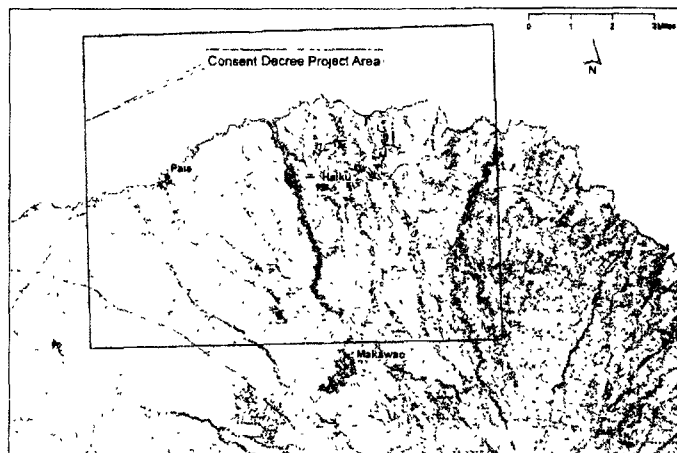
Interconnection would also provide economic benefits during times that ample water is available in the Wailoa ditch (supplying the Kamole WTP) that could serve the Central system and displace more expensive Central system resources. The costs of expanding the Kamole WTP for this purpose, however, exceed these system operation efficiency benefits (even without considering the costs of necessary interconnecting transmission improvements). It would not be economical to use treated water from the Lower Kula system or Upper Kula system to serve Central system needs. This would be possible only during wet winter months with ample surface water source flows and when upcountry storage reservoirs are full. These times tend to coincide with periods of minimum demand and lowest production costs on the Central system.

Although there are benefits to interconnecting water systems, interconnection of the Central and Upcountry systems would not, in itself, avoid the need to develop new water sources for both of these systems. Interconnection could provide a limited amount of additional redundancy in system capacity (equipment), but both systems are in need of new sources of water to meet growing water demand.

### **Policy and Feasibility Considerations**

#### **Compliance with EMPLAN Consent Decree**

The 1990 Maui County WUDP identified the development of wells in the Haiku aquifer (and associated water transmission) as a featured strategy to supply water to the Central District system. A concurrent East Maui Water Study was commissioned to develop this strategy. The draft 1992 WUDP update (never adopted) also featured this strategy as the primary means to provide new Central District water supply. The project, named the East Maui Water Development Plan (EMPLAN), moved forward with preparation of



an environmental impact statement (EIS) and a supplemental EIS which were challenged in court. The court case was settled between the plaintiffs and the County by a Consent Decree.

The County is bound by a list of terms specified in the EMPLAN Consent Decree including the following:

- Only Phase I of the EMPLAN will be implemented until a completely new EIS is prepared. This includes construction of the Hamakuapoko wells and limited transmission connection to the Central District system.
- The County will not develop groundwater in an agreed-upon portion of the East Maui region until a rigorous cost/benefit analysis is performed which shall, among other things, address planning for stream restoration in the agreed-upon region.
- The County will "rigorously investigate and pursue the availability of surface water" from the Waikapu, Iao and Waihee areas including a rigorous cost/benefit analysis.
- Any new groundwater development projects in the agreed-upon East Maui region will be consistent with the County WUDP and the State Water Code.
- The County will work with the USGS and plaintiffs to develop a test well to determine whether development of groundwater resources in the agreed-upon East Maui region would affect surface water resources in the region.
- As long-term agricultural water needs are reduced, a stream restoration program will be studied, developed and initiated by the County.

Compliance with the terms of the EMPLAN Consent Decree would be necessary prior to development of wells within the EMPLAN area. This area is shown on the map above.

#### **Potential Impacts of Groundwater Pumping on Existing Wells, Springs and Uses**

In both the Haiku and Honopou aquifer areas there are existing wells, springs and surface water sources used by residents. Impacts of basal groundwater pumping in these areas upon these existing uses must be considered. Substantial concerns were raised by residents in these areas at the Water Advisory Committee meetings.

The impacts of basal groundwater pumping on down-gradient wells, springs and surface water sources in the Haiku aquifer have been debated previously in several venues, including agency and judicial reviews of the environmental assessments and environmental impact statements for the East Maui Water Plan. There are strongly held beliefs and no broad consensus regarding these potential impacts.

There has been substantially less discussion of impacts of basal well pumping in the Honopou aquifer. The hydrology of the Honopou aquifer differs from the Haiku aquifer in several respects. It is expected that the basal water lens is thinner in this area and expected well yields would be substantially lower for the wells contemplated at an elevation of approximately 600 feet. There are established uses in this area by residents at low elevations that could be affected by up-gradient wells.

#### **Acceptance by East Aquifer Area Residents**

At Water Advisory Group meetings substantial and passionate concerns were raised by Haiku and Honopou aquifer area residents regarding the impacts and propriety of developing basal groundwater wells in these aquifers. Concerns were expressed about impacts on area residents (discussed above) and regarding pumping water from these areas to serve distant uses.

Honopou area residents expressed frustration that they have suffered from decades of surface water diversions from the streams in their vicinity to support irrigation uses in the Central Maui area. The prospect of developing basal wells in these aquifers to serve additional uses in central Maui raised considerable concern and objections.

In order to address concerns from Honopou area residents, the Honopou aquifer scenario of the Eastward Basal Groundwater strategy was reconfigured to reach beyond the Honopou aquifer to the Waikamoi aquifer in an area with fewer existing down-gradient uses. This alternate scenario may not fully address the concerns of the Honopou area residents.

Acceptance by east aquifer area residents is both a policy and a tactical concern. The merits of concerns of the residents of these areas should be considered as a matter of policy. The passion of opposition of area residents and the potential for organized opposition to projects in these areas should also be considered as a tactical concern.

### **Efficacy and Water Quality of Wells at 1000-Foot Elevation**

It is presumed in the economic analyses that wells at the 1000-foot elevation in the Haiku area will be productive and that they will be free of contamination from DBCP and other toxic chemicals used in the area in the past. Although the efficacy and the water quality at this elevation in this area are expected to be acceptable, this is yet untested. Prior to any commitment to this strategy and prior to substantial expenditures on the large costs of the associated transmission system, sufficient test wells should be drilled to verify production efficacy and water quality.

### **Capital Cost Financing**

Development of basal wells in the Haiku, Honopou or Waikamoi aquifers would require substantial capital investments for water transmission improvements. Since completion of the major water transmission components of the strategy is necessary before any substantial water production could benefit the Central District system it is not possible to effectively "phase" the installation of water transmission. The full capital requirements of the strategy would have to be provided at the onset of implementation.

### **Economic Analysis**

The economic analysis of the Eastward Basal Groundwater strategy was conducted in several iterative rounds. Analyses of wells in the Haiku area at 1500-ft. elevation and wells in the Honopou area at 600-ft. elevation were examined and presented in the *Candidate Strategies* chapter. In later analyses several additional scenarios were examined, including wells at a lower 1000 ft. elevation in the Haiku area, wells further east in the Waikamoi aquifer and use of the Lowrie Ditch to transmit water to the Central Maui region. These scenarios are described above. Alternate assumptions regarding possible future power costs were incorporated in several rounds of analyses. In the analyses presented in this report, strategies are characterized for two alternate electric power cost scenarios representing lower and higher future energy prices.

Economic analysis of the final resource strategies was performed using an integrated resource analysis model that was configured for the Central District system.

The results of the economic analyses are presented in charts that show the net present value of total DWS Central District system costs over a fifty-year study period. The charts show the net present value of the following cost categories for each of the strategies:

- Variable Operating Costs -- These are operating costs that vary as a direct function of the amount of water produced by each of the resources in the analysis in each year of the study period. These are primarily energy costs and costs for purchase of source water where applicable.
- Fixed Operating Costs -- These are operating costs that change with the addition of new resources but are not directly affected by the amount of water produced by each resource. These costs include the costs of maintaining and operating the existing system and new resources as they are added to the system, including labor, and an apportioned share of DWS administrative operations and repair expenses.

- **Capital Costs** -- These are the amortized capital carrying costs of the Central District system, including capital carrying charges (interest and depreciation) for new resource assets and depreciation and replacement costs for existing system assets.
- **DSM Costs** -- These are the total costs of implementing demand-side management (water conservation) programs, including the full measure and installation costs (whether borne by the program participant or by the utility and including any utility incentives) and costs to administer the programs.
- **Total Costs** -- These are the sum of the four categories of costs listed above.

Two types of charts are presented:

Total fifty-year study period costs for each strategy

Differences in fifty-year study period costs with respect to a reference strategy

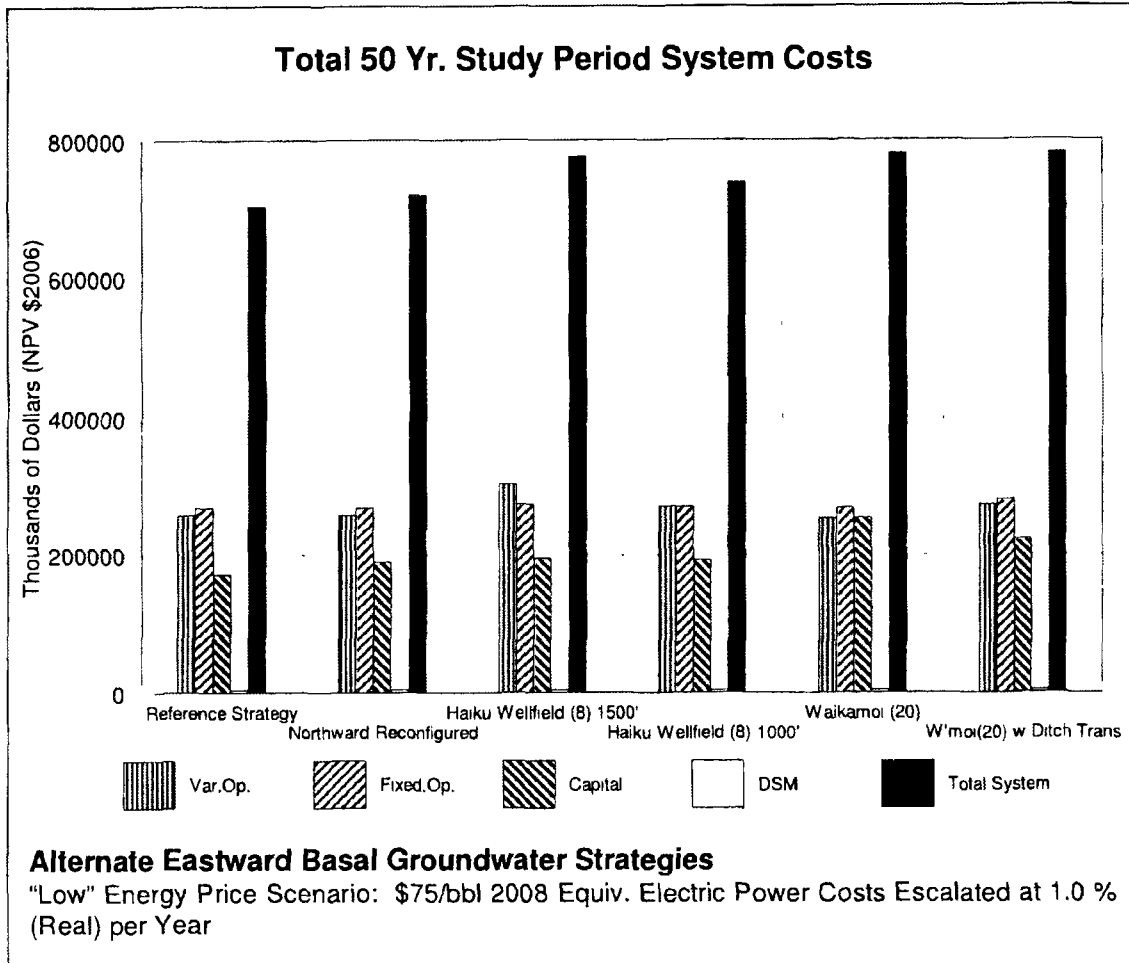
The first chart shows the total costs for the DWS Central District system for the fifty-year study period. Later charts show the same data presented as differences for each cost category for each strategy compared to a reference strategy. This format focuses on the differences between the strategies and makes differences easier to see. It is important to remember, however, that the costs represent total DWS system costs, not only the costs of the featured resources in each strategy.

The two strategies presented at the left of each chart are identical in all of the charts presented. The first strategy at the far left is the "Reference Strategy". This strategy provides the "zero point" for all of the charts that present costs as differences from the reference strategy. The second strategy from the left is the "Northward Reconfigured" basal well development strategy. This strategy is one of the Final Candidate Strategies and is provided in all of the charts as a standard basis of comparison and to indicate a reference for the magnitude of costs portrayed.<sup>14</sup>

Two charts are presented for each set of strategies that represent alternate energy cost scenarios. During the time in 2008 that the Final Candidate Strategies were analyzed and presented to the Water Advisory Committee, the cost of electrical power changed dramatically as crude oil prices increased from about \$60 per barrel to \$140 per barrel and then decreased again to about \$60 per barrel. Energy costs are a significant component of the total costs of the DWS system. In order to consider the uncertainty regarding future energy costs a "low" energy cost scenario (starting at \$75 per barrel) and a high energy cost scenario (starting at \$125 per barrel) are pre-

---

14. This is convenient since the scale of charts varies considerably depending on which strategies are included in each chart.



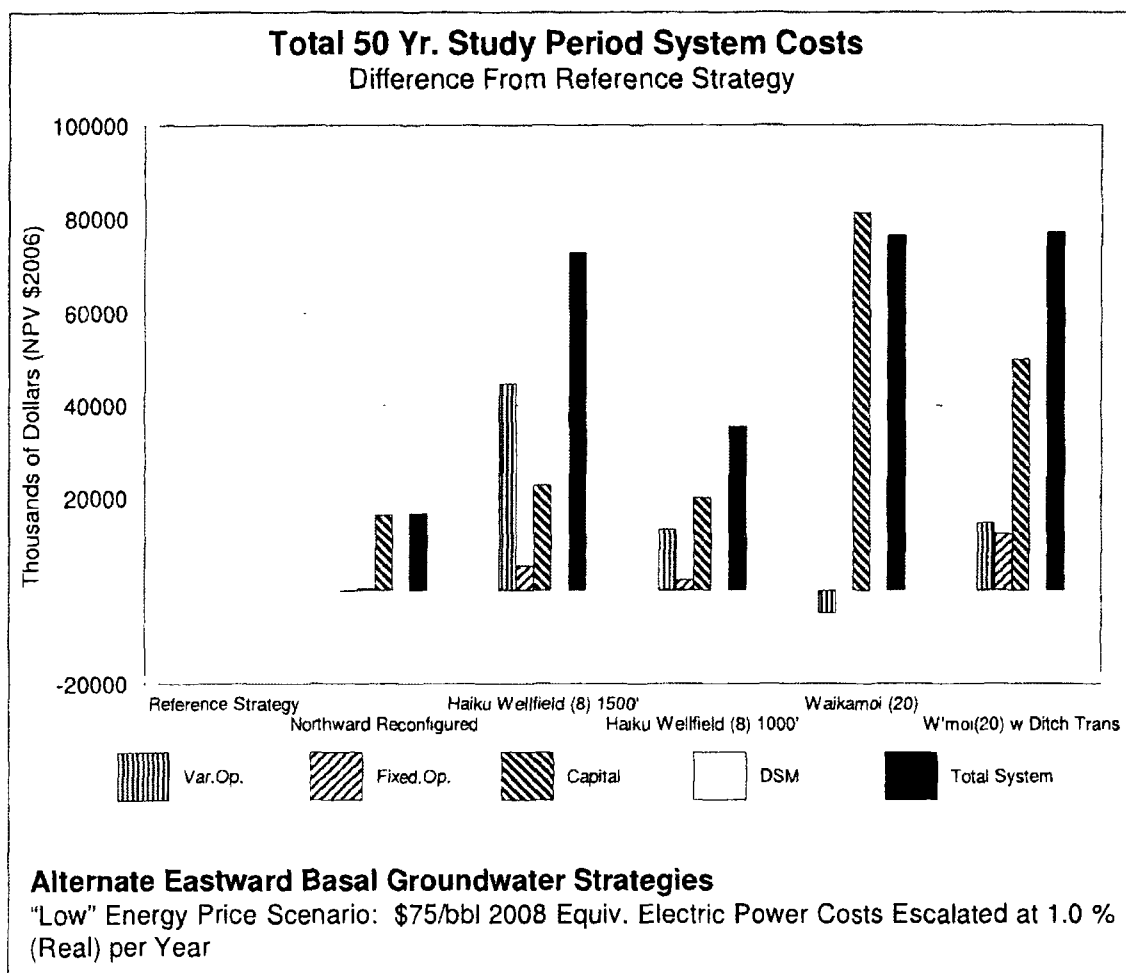
sented for each set of candidate strategies. In each scenario, energy costs are assumed to increase at a rate 1% higher than the rate of general inflation.<sup>15</sup>

#### Alternate Eastward Basal Groundwater Strategies

The chart above shows the net present values for the DWS Central District system over a fifty-year study period (2005 - 2055). Variable operating, fixed operating and capital costs are all substantial components of total costs in all strategies. The cost of the DSM (conservation) programs included in each of the strategies is a small component of costs.

The differences between the cost components of the strategies is discernible but is more clearly seen in the following chart that shows the same data presented as differences with respect to the Reference Strategy shown at the far left.

15. In addition to the analyses presented in this report several alternate assumptions regarding future energy prices were examined.

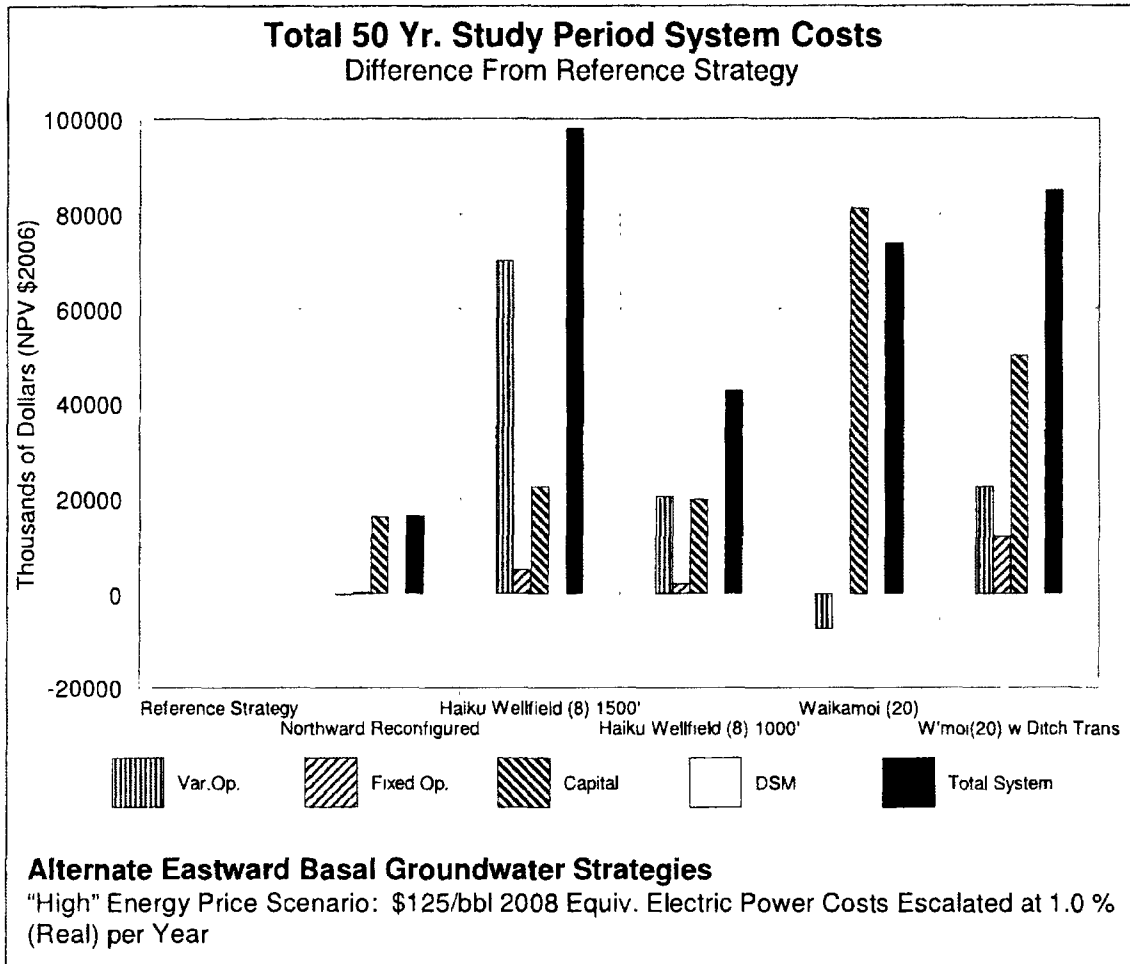


The chart above shows the same data as the previous chart, except all costs are portrayed as differences from the Reference Strategy costs at the far left. The "Northward Reconfigured" strategy is provided as a reference. Four strategies are shown for comparison in the center and right side of the chart.

The center two strategies are the Haiku Wellfield strategies featuring a series of eight basal wells in the Haiku aquifer with transmission to the Central District system. The difference between these strategies is the location and elevation of the wells (1500 ft. and 1000 ft.) which primarily affects variable operating costs (electrical energy for pumping) and to a lesser extent affects transmission capital costs. Locating the wells at the lower 1000-ft. elevation is more economical due to the lower electrical pumping costs.

The two strategies at the right are the Waikamoi Wellfield strategies with wells located at 600-ft. elevation further east in the Waikamoi aquifer. The Waikamoi strategy has substantially lower electrical pumping costs due to the lower elevation of the wells, but this is much more than offset by the higher capital costs of transmission to the farther Waikamoi aquifer. The rightmost strategy features the Waikamoi wellfield using the Lowrie Ditch to transfer water to a water treatment plant in the Central Maui area. This strategy has lower transmission costs than the Waikamoi strategy shown to its left but also has the additional capital and variable and fixed operating costs associated with constructing and operating the water treatment plant.

The Haiku wellfield strategy with wells at an elevation of 1000 ft. is the most economical of the Eastward Basal Groundwater options shown. This strategy is used to characterize the Eastward

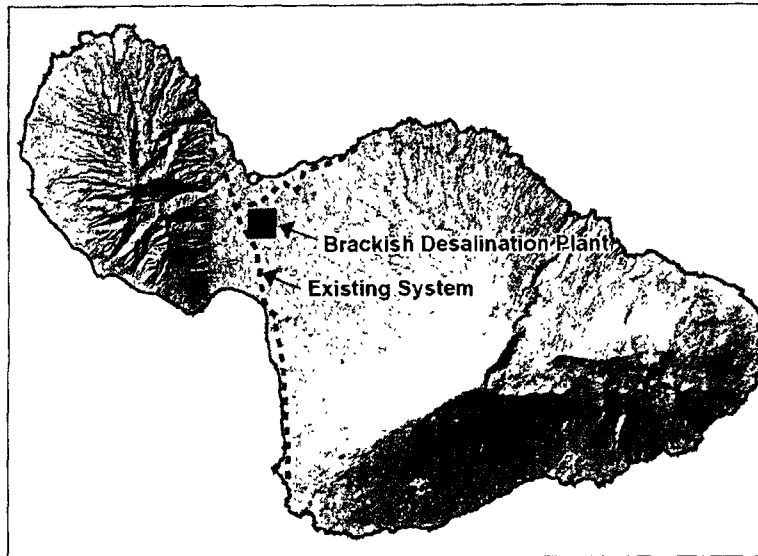


Basal Groundwater strategy in the comparisons of the Final Candidate Strategies in the following section of this report.

The chart above shows the same strategies as the previous chart, except that higher energy costs are assumed. The electrical costs assumed in the analyses shown on this chart are the high energy cost scenario. These costs reflect crude oil prices of \$125 per barrel in 2008 (\$0.34 per KWH marginal cost in the high power consumption block for large customer MECO Schedule P tariff) assumed to escalate at 1% per year in real terms (1% higher than general inflation).<sup>16</sup>

The higher electrical power costs shown on this chart make the cost advantages of the lower elevation wells more pronounced. The 1000-ft. Haiku wellfield strategy shows more economy compared to the higher elevation 1500-ft. Haiku wellfield strategy. The Waikamoi wellfield strategy with 600 ft. elevation wells is less expensive than the 1500-ft. Haiku wellfield due to the increased magnitude of energy costs savings from the lower well elevations. The Haiku wellfield at 1000-ft. elevations remains the most economical strategy assuming the higher energy costs.

16. The marginal power costs included in the variable costs do not include customer charge and demand charge components of electricity bill. These components of electrical costs are included in fixed operating costs.



## **D. Desalination of Brackish Groundwater**

### **Summary**

This strategy features construction and operation of a water treatment plant to desalinate brackish groundwater to potable standards. The characteristics of the desalination plant were derived from a recent study performed for the County of Maui.<sup>39</sup>

All of the implementations of this strategy include a "basic" Demand-Side Management program that is designed to attain 15% of the water efficiency technical potential in a period of five years.<sup>40</sup>

This strategy is one of the most expensive strategies due to the combination of capital and operation costs. Water produced by desalination of brackish water is the most expensive alternative in terms of operation costs.

### **Project Design Scenarios**

The configuration of a desalination plant was examined in the *Candidate Strategies* chapter. The configuration of the plant in the final strategies analysis is the four-train configuration that was optimized in the previous analysis. The characteristics of this project are reported in detail in Appendix B.

### **Policy and Feasibility Considerations**

Desalination of water is particularly energy-intensive. For this reason extensive water desalination represents a commitment to energy consumption and its corollary considerations: needs for energy generation resources, impacts on greenhouse gas emissions and energy price volatility.

Desalination also requires disposal of brackish water. Removal of salt from source brackish water increases the salinity of desalination plant effluent. Concern regarding disposal of brack-

39. *Central-South Maui Desalination Feasibility Study*, Brown & Caldwell

40. The DSM program included in each of the Final Candidate Strategies is described in a separate section on this subject and in Appendix A.

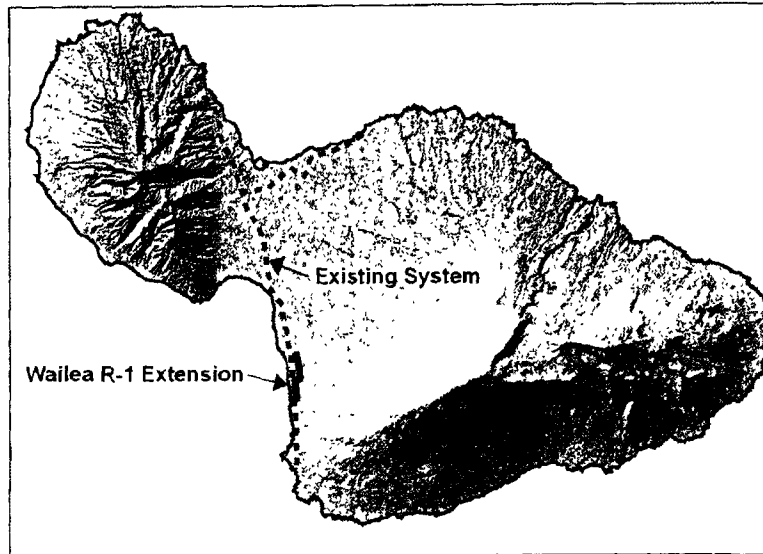
ish effluent is not as serious as similar concerns regarding the desalination of seawater which results in a much more concentrated effluent.

Brackish source water in the Central Maui area could contain contaminants that may pose public acceptance concerns.

### **Economic Analysis**

The economics of brackish water desalination were addressed in the *Candidate Strategies* chapter and its supporting analyses. It was determined in those analyses that brackish water desalination was clearly preferable to seawater desalination for economic reasons. In addition it was determined that for reasonable additional capital costs, a treatment plant with multiple independent parallel filter trains would provide cost-effective benefits by increasing the effective reliability of the plant.

In the analysis of the Final Candidate Strategies in this report, the desalination strategy is characterized identically to the characterization in the *Candidate Strategy* chapter except that several alternate scenarios regarding future energy costs are considered. The economic analysis of this strategy is presented and discussed in the *Comparison of Final Candidate Strategies* section below.



## **E. Extensive Conservation and Wastewater Recycling**

### **Summary**

This strategy features meeting new water needs by increasing recycled water use and implementing water conservation measures to capture three times as much conservation potential as the programs in the other Final Candidate Strategies. This strategy characterizes maximizing the efficient use of water.

This strategy includes building new non-potable water transmission infrastructure to provide water from the existing Kihei Wastewater Treatment Plant (WWTP) to the South Maui area where water could be used to displace existing potable water now used for outdoor irrigation purposes.

This strategy is not the least expensive strategy but has several positive attributes regarding meeting the WUDP planning objectives and may play an important role as a contingency strategy if the viability of other strategies is not verified for an extended period of time.

### **Project Design Scenarios**

There are two principal components to this strategy. One component is increased use of recycled wastewater to displace existing and future potable water use. The second component is more aggressive DSM water conservation programs than what are assumed in the other Final Candidate Strategies. Several scenarios were considered to analyze the maximization and optimization of both of these components.

### **Wastewater Recycling Options**

Several possible water recycling scenarios were examined and described in the Central District Final Candidate Strategies Report transmitted to the BWS for public hearings and recommendations:

- R-1 water transmission and distribution extension from the Kihei Wastewater Treatment Plant (WWTP) to the South Kihei and Wailea areas:
  - Designed with sufficient laterals to displace 3.0 MGD of potable water use.

- Capital costs estimated at approximately \$50 million.
- R-1 water transmission extension from the Kihei WWTP to the Wailea area:
  - Designed to reach large-consumption properties to displace 1.5 MGD of potable water use.
  - Capital costs estimated at approximately \$20 million.
- Upgrading the Kahului WWTP from R-2 to R-1 capability and transmission and distribution extension to the Kahului area:
  - This scenario was determined to be infeasible for economic and logistical reasons.

It was initially determined that the 1.5 MGD Wailea transmission extension option was more cost-effective than the substantially more expensive 3.0 MGD option or upgrading the Kahului WWTP. The 1.5 MGD potable displacement Kihei WWTP option was the scenario examined as a strategy in the Central District Final Candidate Strategies Report transmitted to the BWS for public hearings and recommendations. One recommendation of that report was that a study should be performed to (1) verify the amount of potable water in the Wailea area that could be displaced with R-1 water, (2) verify total project costs and Kihei WWTP long-term production capability and (3) investigate costs and feasibility of alternative strategies to deliver treated wastewater to displace potable use.

The Department of Environmental Management (DEM) published a South Maui R-1 Recycled Water Verification Study dated December 28, 2009. In that study several additional R-1 recycling options were identified that extend transmission infrastructure for the Kihei WWTP including several existing and planned projects. The following projects identified in the DEM study (beyond the existing and planned projects) were analyzed and included in this plan update:

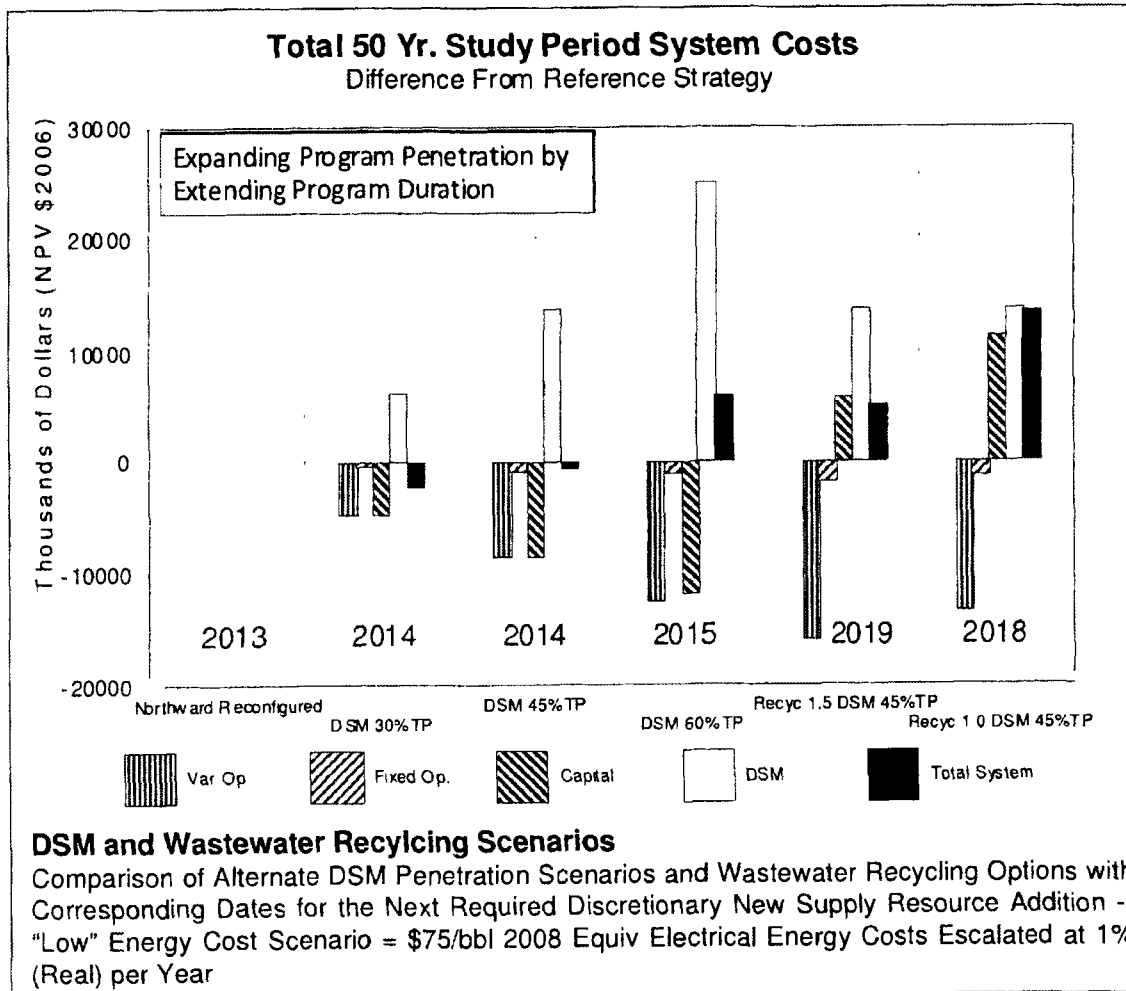
- Option 1: Waipulani Street / South Kihei Road
- Option 3: Liloa Drive / Halekuai Street
- Option 5b: North Kihei / North South Collector Road

The discussion and analysis of the Wailea Transmission option is presented below as it was included in the Central District Final Candidate Strategies Report transmitted to the BWS for public comment and recommendations. Supplemental discussion and analysis of the options identified in the subsequent DEM study are presented in a supplement at the end of this section.

#### **Water Conservation Program Options**

Several possible water conservation program scenarios were examined. In previous analyses the economics of different intensities of conservation program implementation was examined. Conservation programs can be designed to reach increasing proportions of conservation technical potential by providing more extensive program delivery mechanisms and by targeting progressively more expensive potential water saving fixtures, appliances and irrigation system improvements. Conservation programs can also be designed either to attain water savings at less cost to the utility by implementing programs at a slower pace or, alternatively, by accelerating the program water savings by more intensive and more expensive methods.

A series of alternative conservation program implementation scenarios was examined in each of the rounds of analyses of the Final Candidate Strategies. In the most recent round of analyses several implementation scenarios were examined with respect to several assumptions regarding future energy prices. The programs designed to reach 45% of conservation technical potential in ten years that were assumed in the previous rounds of analyses were retained in this Final Candidate Strategy presented in this report.



It should be noted that the first steps recommended to implement any of the conservation program scenarios are similar. Unless there is an urgent crisis regarding sufficient water supplies it is prudent and economical to be diligent but careful and methodical about establishing an aggressive DSM implementation capability in the DWS. The intensity of program implementation can be adjusted as experience with program implementation is attained and as future uncertain water needs and supply option situations continue to develop.

### **Policy and Feasibility Considerations**

Both water conservation and wastewater recycling were consistently viewed as favorable options in discussions with the Water Advisory Committee. These options promote responsible use of water and promote the objective of sustainability.

### **Economic Analysis**

The chart above compares the net present values of the costs for the DWS Central District system for the fifty-year study period (2005 - 2055). All costs are shown as differences compared to the Northward Basal Groundwater strategy (Northward strategy) depicted at the far left. The Northward strategy includes the same DSM programs assumed in all of the other final candidate resource strategies designed to attain 15% of the DSM "technical potential" in a period of five years<sup>41</sup>. The next three strategies depicted in the center of the chart show increasing intensities of DSM implementation to attain 30%, 45% and 60% of the technical potential (T.P.) in seven,

ten and twelve years respectively. All of the programs are assumed to begin in calendar year 2010.

The costs of the DSM programs (in excess of the Northward strategy DSM costs) are shown. These are offset by lower variable operating costs (due primarily to reductions in energy costs that result from smaller water production requirements) and lower capital costs (that result from deferral of new supply resources). The 30% and 45% T.P. options are the most cost-effective. The increasing program implementation and DSM measure costs of the 60% T.P option are not offset by corresponding variable and capital costs.

The "Extensive Conservation and Wastewater Recycling" Final Candidate Strategy is the second strategy from the right on the chart above. This strategy features the 45% T.P. DSM and 1.5 MGD Kihei WWTP R-1 transmission extension resources. Assuming the "low" energy cost scenario this strategy is more expensive than the Northward strategy. This strategy is compared to the other Final Candidate Strategies in the next section of this report. If only 1.0 MGD of potable water would be displaced by the R-1 transmission line, this strategy would be substantially less cost-effective.

Shown just above the horizontal axis labels of the chart are the date that new "discretionary" supply resources would be needed to maintain reliable water supply for the Central District system.<sup>42</sup> The sequence and dates for all resources in each strategy shown in the chart are shown on the table on the following page. Without any DSM programs, the next discretionary supply resource addition would be needed in 2012. With the DSM programs assumed in all of the other Final Candidate Strategies in this report (designed to attain 15% technical potential), the next discretionary supply resource would be needed in 2013. More aggressive DSM program implementation to attain 30%, 45% and 60% of the technical potential defers the need for the next needed resource until 2014, 2014 and 2015 respectively. In conjunction with a DSM program designed to attain 45% technical potential, the Kihei 1.5 MGD WWTP R-1 transmission extension strategy further defers the need for the next supply resource until 2019.<sup>43</sup> If this strategy only defers 1.0 MGD of potable water otherwise supplied by DWS, the next needed resource would be deferred until 2018.

Aside from any economic costs and benefits, these strategies represent viable options to meet mid-term (2012 - 2019) water demands if other strategies are delayed or are not feasible.

The following table indicates the source data for the chart above. The sequence and dates for new resource additions are shown for each of the strategies. The date of the next required discretionary new supply resource in each strategy is highlighted.

---

41. See discussion of the characterization and analysis of Central District DSM end uses, technical potential and DSM program analysis in Appendix A of this report.

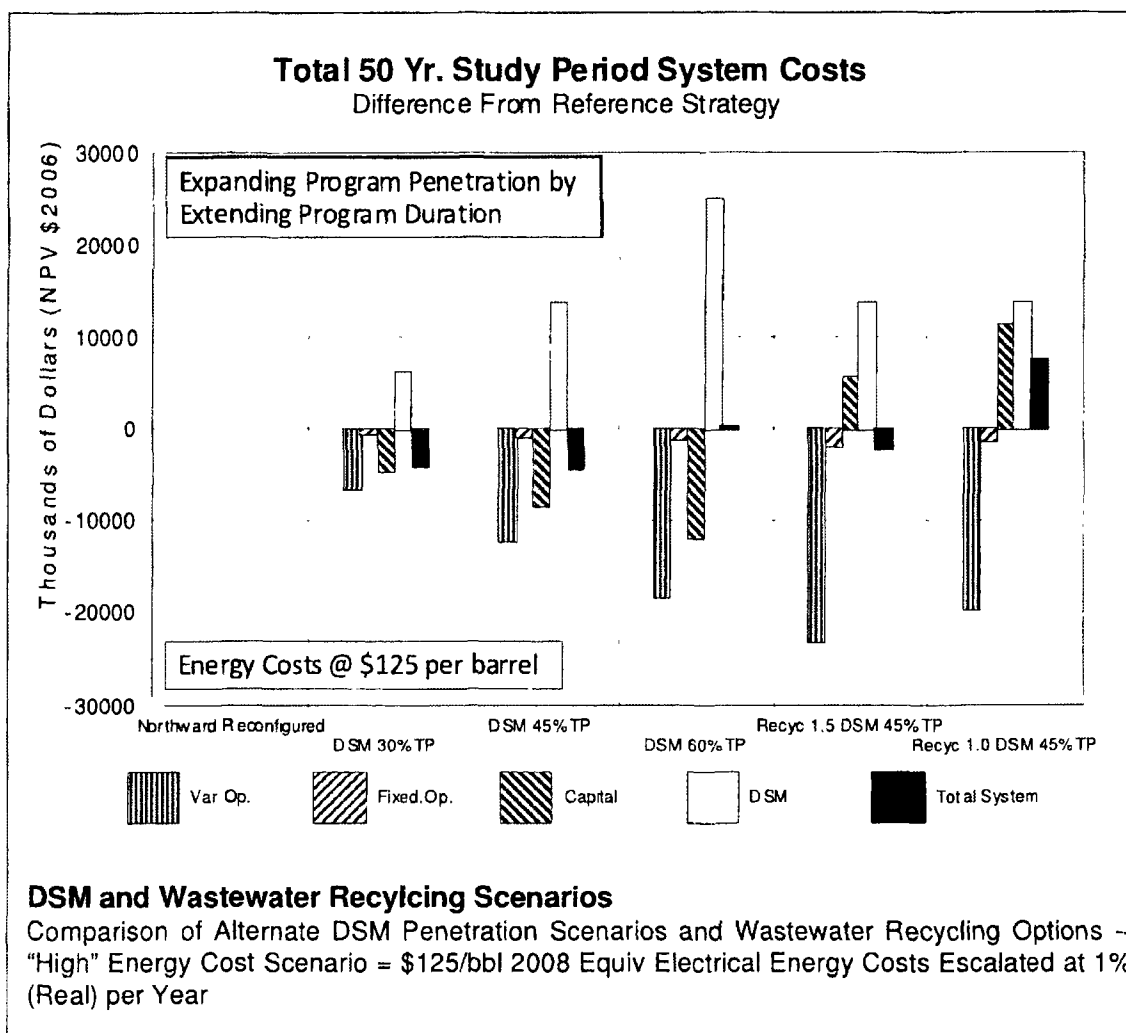
42. The next "discretionary" resource is the first resource needed beyond the committed and near-term resources that are assumed to be implemented in all strategies.

43. The capacity of the R-1 transmission line extension would substantially exceed 1.5 MGD. The strategy assumes that the amount of recycled water supplied by the line would displace 1.5 MGD of potable water supplied by the DWS system that is or would otherwise be used for irrigation uses.

# Central District Final Candidate Strategies

"Low" Energy Price Scenario: \$75/bbl 2008 Equiv. Electric Power Costs Escalated at 1.0% (Real) Per Year

| System Strategy Name Description     | Central System Northward (DSM 15% TP) Multiple 350GPM Wells                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Central System DSM 30%TP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Central System DSM 45%TP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Central System DSM 60%TP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Central System Recyc 1.5 DSM 45%TP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Central System Northward w No DSM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demand Projection                    | Base Case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Base Case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Base Case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Base Case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Base Case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Base Case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Demand Proj Source                   | HDA 2006 Update v31 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | HDA 2006 Update v31 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | HDA 2006 Update v31 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | HDA 2006 Update v31 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | HDA 2006 Update v31 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | HDA 2006 Update v31 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Notes                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Var Op Esc Rate                      | 2.50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2.50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2.50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Fix Op Esc Rate                      | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Cap Cost Esc Rate                    | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Discount Rate                        | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Cost of Capital                      | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 6.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Unserved Demand Total                | 741,826                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 741,826                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 741,826                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 741,826                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 741,826                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 741,826                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Cap Shortfall 2006-30 MGD-Yrs        | 19,244                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 19,244                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 19,244                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 19,244                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 19,206                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 19,206                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Cap Shortfall 2007-30 MGD-Yrs        | 11,792                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 11,792                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 11,834                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11,754                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 11,754                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11,817                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Cap Shortfall 2008-30 MGD-Yrs        | 4,365                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4,370                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4,406                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4,336                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4,327                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4,389                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Difference from Base Plan            | \$K NPV 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | \$K NPV 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | \$K NPV 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | \$K NPV 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | \$K NPV 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | \$K NPV 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 25 Year Planning Period Costs        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Variable Operation Cost NPV          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3,149                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | -5,582                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -7,907                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -9,897                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3,537                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Fixed Operation Cost NPV             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -322                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 526                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -719                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -1,197                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 301                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Capital Cost NPV                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -4,215                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -5,984                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -8,266                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 894                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3,858                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| DSM Program Cost                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6,195                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 13,802                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 25,104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 13,802                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -4,314                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Total System Cost NPV                | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1,491                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1,700                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6,212                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3,602                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3,382                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 50 Year Study Period Costs           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Variable Operation Cost NPV          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4,537                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | -8,513                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 12,591                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -15,941                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4,792                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Fixed Operation Cost NPV             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -424                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -749                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -1,065                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -1,823                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 353                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Capital Cost NPV                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -4,581                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -6,387                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11,901                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 5,801                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4,258                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Total System Cost NPV                | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -2,112                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -593                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 6,068                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5,104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4,413                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 25 Year Planning Period Rate Impacts |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Avg Annual DWS Rate Increase         | 3.60%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3.67%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.67%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.72%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.75%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.61%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Levelized Unit Cost (\$/kgal)        | \$3,659                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | \$3,652                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | \$3,658                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | \$3,657                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | \$3,673                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | \$3,656                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Resource Addition Sequence           | DSM DTD Indr 15TP<br>2010<br>DSM DTD Outdr 15TP<br>2010<br>Kupaa Well<br>2008<br>Mau Lan Wells<br>2008<br>Generic Backup 1<br>2009<br>Iao Tank Site Well<br>2009<br>Waikapu South 1<br>2009<br>Waikapu Tank Well<br>2009<br>Waikapu South 2<br>2011<br>Maheua (2)<br>2013<br>Generic Backup 1<br>2014<br>Generic Backup 1<br>2016<br>Waipili (2)<br>2016<br>Waipili (2)<br>2018<br>Kahakuloa (4)<br>2019<br>Generic Backup 1<br>2020<br>Waipili (2)<br>2021<br>Po'eua (2)<br>2022<br>Generic Backup 1<br>2024<br>Supplemental Wells<br>2025<br>Supplemental Wells<br>2027<br>Supplemental Wells<br>2028<br>Supplemental Wells<br>2029 | DSM DTD Ind 30%<br>2010<br>DSM DTD Out 30%<br>2010<br>Kupaa Well<br>2008<br>Mau Lan Wells<br>2008<br>Generic Backup 1<br>2009<br>Iao Tank Site Well<br>2009<br>Waikapu South 1<br>2009<br>Waikapu Tank Well<br>2009<br>Waikapu South 2<br>2011<br>Maheua (2)<br>2014<br>Waipili (2)<br>2015<br>Generic Backup 1<br>2016<br>Waipili (2)<br>2018<br>Waipili (2)<br>2019<br>Kahakuloa (4)<br>2020<br>Generic Backup 1<br>2021<br>Waipili (2)<br>2023<br>Po'eua (2)<br>2025<br>Supplemental Wells<br>2026<br>Supplemental Wells<br>2029<br>Supplemental Wells<br>2030 | DSM DTD Ind 45%<br>2010<br>DSM DTD Out 45%<br>2010<br>Mau Lan Wells<br>2008<br>Kupaa Well<br>2008<br>Waikapu South 1<br>2009<br>Generic Backup 1<br>2009<br>Iao Tank Site Well<br>2009<br>Waikapu Tank Well<br>2009<br>Waikapu South 2<br>2011<br>Maheua (2)<br>2014<br>Generic Backup 1<br>2016<br>Waipili (2)<br>2018<br>Waipili (2)<br>2019<br>Kahakuloa (4)<br>2020<br>Generic Backup 1<br>2021<br>Waipili (2)<br>2024<br>Po'eua (2)<br>2025<br>Supplemental Wells<br>2027<br>Supplemental Wells<br>2029<br>Supplemental Wells<br>2030 | DSM DTD Ind 60%<br>2010<br>DSM DTD Out 60%<br>2010<br>Kupaa Well<br>2008<br>Mau Lan Wells<br>2008<br>Generic Backup 1<br>2009<br>Iao Tank Site Well<br>2009<br>Waikapu Tank Well<br>2009<br>Waikapu South 2<br>2011<br>Maheua (2)<br>2014<br>Generic Backup 1<br>2016<br>Waipili (2)<br>2018<br>Waipili (2)<br>2019<br>Kahakuloa (4)<br>2020<br>Generic Backup 1<br>2021<br>Waipili (2)<br>2024<br>Po'eua (2)<br>2025<br>Supplemental Wells<br>2027<br>Supplemental Wells<br>2029<br>Supplemental Wells<br>2030 | DSM DTD Ind 45%<br>2010<br>DSM DTD Out 45%<br>2010<br>Kupaa Well<br>2008<br>Mau Lan Wells<br>2008<br>Generic Backup 1<br>2009<br>Iao Tank Site Well<br>2009<br>Waikapu Tank Well<br>2009<br>Waikapu South 2<br>2011<br>Maheua (2)<br>2014<br>Koh Recyc 1 SMGD<br>2015<br>Maheua (2)<br>2018<br>Waipili (2)<br>2020<br>Generic Backup 1<br>2021<br>Waipili (2)<br>2023<br>Kahakuloa (4)<br>2024<br>Generic Backup 1<br>2025<br>Waipili (2)<br>2026<br>Po'eua (2)<br>2027<br>Supplemental Wells<br>2028<br>Supplemental Wells<br>2030 | No DSM<br>2010<br>No DSM<br>2010<br>Kupaa Well<br>2008<br>Mau Lan Wells<br>2008<br>Generic Backup 1<br>2009<br>Iao Tank Site Well<br>2009<br>Waikapu South 1<br>2009<br>Waikapu Tank Well<br>2009<br>Waikapu South 2<br>2011<br>Maheua (2)<br>2014<br>Generic Backup 1<br>2016<br>Waipili (2)<br>2018<br>Waipili (2)<br>2019<br>Kahakuloa (4)<br>2020<br>Generic Backup 1<br>2021<br>Waipili (2)<br>2023<br>Kahakuloa (4)<br>2024<br>Generic Backup 1<br>2025<br>Waipili (2)<br>2026<br>Po'eua (2)<br>2027<br>Supplemental Wells<br>2028<br>Supplemental Wells<br>2029<br>Supplemental Wells<br>2030 |



The chart above shows the same options as the previous chart except that the high energy cost scenario is assumed. Assuming higher energy prices, the more intensive 60% T.P. DSM program implementation is more cost-effective than the less aggressive options. The "Extensive Conservation and Wastewater Recycling" Final Candidate Strategy also becomes more cost-effective and costs less than the Northward strategy.

## Maui County Department of Water Supply Water Conservation Efforts

*The DWS maintains 750 miles of water lines, 145 storage tanks with 295 million gallons of water storage capacity, six water treatment facilities, and 35 groundwater sources for 35,562 customers. DWS employees maintain the water system 24/7. The DWS also works hard to sustain its water resources for the long term. We work closely with the State to ensure that our sources are protected for the public trust, that our customers will have continuous and reliable water supply.*



The Maui County Department of Water Supply is developing and expanding its water conservation program, which includes both supply side and demand side measures.

### Supply Side Water Conservation Measures

Supply-side measures to date include leak detection, preventive and predictive maintenance, use of reclaimed water and alternate system backups and resource protective measures

#### **(1) Leak Detection:**

An effective leak detection program is critical to identify unaccounted for water in order to proactively prevent as much water loss as feasible. There are major benefits to having a leak detection program that 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.

The Department of Water Supply Division of Water Resources & Planning employed two personnel primarily responsible for leak detection identification, assistance to field crews and property owners (only if the leak was on County property). Leak detection staff was sent out when a leak was suspected, either based on system performance, or flow and pressure monitoring undertaken as part of hydraulic model development or other efforts. A total of 361 miles of transmission lines were surveyed from FY 2008 - 2013; 88 leaks were found and repaired (mostly in the Central area).

**(2) Preventive & Predictive Maintenance:** This is two pronged. Facilities are regularly maintained and pumps are periodically calibrated. In the course of such maintenance, facilities are regularly checked for signs of wear. DWS also has a system inventory with age, diameter and material of lines and other facilities. Based upon the status and performance of system facilities, upon known inventory status and demand trends, DWS

## Na WaiEha

---

maintains a 30-year project list. This can help to reduce unaccounted-for water in the system by targeting old and substandard lines for replacement.

**(3) Reclaimed Water Use:** About 3.905 MGD is in use countywide with 1.8 MGD utilized in South Maui. As part of its Water Use & Development Plan process, DWS is currently investigating the costs and benefits of large scale capital investment to further expand reclaimed water use to offset potable use.

**(3) Back-up Sources:** In the event of a major leak, most areas of the Central system can be served by other sources so that any key portion of system could be valved off at need.

**(4) Watershed & Resource Protection:**

DWS has provided financial support to seven Watershed Partnerships on Maui and Molokai to ensure upland watersheds are fully functioning so fresh water resources can be utilized and enjoyed by the people of Hawaii in perpetuity. Since 1995, we have provided \$8.12 million dollars of funding to these seven Watershed Partnerships comprise a total number of 54 of partners. The partners represent ranchers, federal, state, county and local government, water utilities, large land holders, fire task forces, non-profits, non-government

associations, public land trusts, the King Kamehameha schools and many representatives from the private business sector.

All of these partners, including the County and State entities, are working in partnership to protect over 150,000 acres located within a key watershed area critical to future DWS water source protection, development and recharge.

The Watershed Partnerships collectively address a variety of threats to the watershed including activities such as: ungulate control through fencing and targeted hunting practices; eradication of invasive weeds and plants; reforestation and vegetation of upland areas and other habitats critical to the recharge and protection of water supply; and suppression and management of wild land fires resulting in the loss of forests. These efforts have successfully resulted in essential tangible outcomes and deliverables and include: fence installation, maintenance and monitoring resulting in a reduction in the feral animal populations; eradication of invasive weeds and plants (nearly 35,000 acres); hunting programs to increase access for hunters and reduce feral animal populations; restoration of forests with native species of plants and trees; documentation, protection and research of rare species; establishment of volunteer programs in all watersheds; interpretive hikes and field studies; resource monitoring and mapping; installations of trails, camps and helicopter landing zones; educational presentations and displays at public events and schools; and landscape level watershed protection through the protection and out planting of native plant species and Countywide community garden projects.

## Na WaiEha

**DWS FUNDING PROVIDED FOR LONG TERM PROTECTION OF WATER SOURCE  
THROUGH WATERSHED PARTNERSHIPS  
[Table 1]**

| Watershed Entity                                    | YEARS<br>(FY)  | Funding<br>Amount |
|-----------------------------------------------------|----------------|-------------------|
| East Maui Watershed Partnership                     | 2005 - 2014    | \$ 3,299,560.00   |
| The Nature Conservancy - Waikamoi                   | 1997 - 2014    | \$ 2,281,310.00   |
| East Molokai - The Nature Conservancy               | 2000 - 2014    | \$ 375,600.00     |
| Leeward Haleakala Watershed Restoration Partnership | 2005 - 2014    | \$ 1,277,100.00   |
| West Maui Mountains Watershed Partnership           | 1998 - 2014    | \$ 1,433,910.00   |
| Maui Invasive Species Committee (MISC)              | 2000 - 2014    | \$ 3,429,956.00   |
| Hawaii Agricultural Research Corporation (HARC)     | 2012 - 2014    | \$ 120,000.00     |
| Pu'uKukui Watershed Partnership *                   | 2014           | \$ 200,000.00     |
| Maui Nui Botanical Garden                           | 2004 - 2014    | \$ 430,000.00     |
| SUB TOTAL (Central water system)                    | 1995 - present | \$ 13,159,310.00  |
| TOTAL                                               | 1997 - present | \$17,307,346.00   |

NOTES: [REDACTED] refers to those partnerships whose work directly benefits the Central water system area.

\* MISC does actively work within watersheds critical to Central DWS water sources, however it is difficult to accurately determine the exact amount of funding spent

\*\* Pu'uKukui first received DWS funding during FY14

### Demand Side Water Conservation Measures

Demand-side measures to date include low flow fixture distribution, a tiered rate structure, public education and outreach programs, and regulations as well as resource protection. Ongoing planning efforts are evaluating the benefits and costs of increased aggressiveness in these efforts.

#### **(1) Low Flow Fixture Distribution**

To date DWS has given out 36,481 low flow showerheads, 38,318 bathroom aerators, 24,524 kitchen aerators, 3,823 self-closing hose nozzles, and many more leak detection dye tablets, vs. a customer base of about 35,000 meters. (See Table 2)

## Na WaiEha

**LOW FLOW FIXTURE GIVE AWAY – 1998 – PRESENT**  
[Table 2]

| District     | Showerheads   | Bath<br>Faucet<br>Aerators | Kitchen<br>Faucet<br>Aerators | Garden<br>Hose<br>Nozzles | Toilet<br>Tank<br>Bags |
|--------------|---------------|----------------------------|-------------------------------|---------------------------|------------------------|
| Central      | 23,000        | 24,768                     | 15,687                        | 14,251                    | 7,278                  |
| UpCountry    | 9,230         | 9,707                      | 6,308                         | 6,331                     | 783                    |
| Lahaina      | 2,340         | 2,336                      | 1,549                         | 1,293                     | 436                    |
| Hana         | 355           | 358                        | 265                           | 242                       | 21                     |
| Molokai      | 1,186         | 1,149                      | 719                           | 766                       | 105                    |
| <b>TOTAL</b> | <b>36,481</b> | <b>38,318</b>              | <b>24,524</b>                 | <b>22,883</b>             | <b>3,823</b>           |

**NOTE:** For each fixture request there is a limit of two showerheads, 1 hose nozzle.  
This accounting does not include the 2013 Maui County Fair giveaways.

### (2) Water Audits/Retrofits

The Department co-funded its first direct install retrofits in the late 1990s with low flow toilets. However, no large scale programs were funded. More recently, smaller retrofit projects of high efficiency toilets have been installed in various County properties.

Ongoing retrofit trials include:

- **Ka Hale A Ke Ola**, a homeless resource center with about 70 units and two dormitories - 74 toilets, two urinals, 76 showers and 76 faucet aerators will be replaced with the most water efficient products available. Ka Hale A Ke Ola is located in the DWS Central Water System District in Wailuku.
- **Hale Makana O Walaie** is a low income housing complex with 200 units. Two Hundred showerheads, 200 bathroom and kitchen faucet aerators will be replaced with more water efficient models. Located in Wailuku.
- **Maul County Government Building** includes the 5<sup>th</sup> and 9<sup>th</sup> floors of the county building will be retrofitted with 10 waterless urinals, 22 dual flush toilets. Located in Wailuku.
- **Parks and Recreation** - DWS staff is working with Parks Department Staff to retrofit aquatic facilities with more efficient fixtures and conserve water in many other ways as well.

# Na WaiEha

## MAUI COUNTY DWS RETROFIT PROJECTS

[Table 3]

| Facility          | Location    | No. of Toilets Replaced | No. of Showerheads Replaced | No. of Kitchen/bathroom Faucet aerators installed |
|-------------------|-------------|-------------------------|-----------------------------|---------------------------------------------------|
| Hale Mahalo       | Maui        | 0                       | 0                           | 0                                                 |
| Maui Gardens      | Maui        | 148                     | 62                          | 1,024                                             |
| Maui Hale         | Maui        | 0                       | 0                           | 0                                                 |
| Lahaina Sun       | Lahaina     | 109                     | 0                           | 0                                                 |
| Komohana Hale     | Lahaina     | 0                       | 0                           | 0                                                 |
| Hale Mahalo Home  | Kaunapali   | 0                       | 0                           | 0                                                 |
| Hale Mahalo       | Kaunapali   | 0                       | 0                           | 0                                                 |
| Ka Hale O Kila    | Waipahoehoe | 84                      | 76                          | 76                                                |
| Mokuaia Apartment | Waipahoehoe | 16                      | 16                          | 16                                                |
| <b>TOTAL</b>      | <b>10</b>   | <b>939</b>              | <b>869</b>                  | <b>799/720</b>                                    |

The Water Use & Development Plan, currently in development, is evaluating the costs and benefits of high efficiency fixture rebates and direct installation programs as part of the Water Conservation Program. Ongoing trials will help to provide some preliminary data on the effectiveness of some of these options. Longer term options for the future may also include review of various means of sub-metering multi-family units and multi-

## Na WaiEha

---

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.

### **(3) Water Conservation Pricing**

DWS currently has a tiered rate structure to encourage conservation (Maui County Code Chapter 14.10). Data improvements under way could enable the Department to move toward a more aggressive tier structure.

### **(4) Regulations Related To Water Conservation**

Maui County has the following existing regulation and rules that support water conservation:

- 1) Prohibition of discharging cooling system water into the public wastewater system (Maui County Code Title 14, Chapter 14.21A.015);
- 2) Plumbing code regulations that require low flow fixtures in new development (Maui County Code Title 16.20B);
- 3) Requirements that all commercial properties within 100' of a reclaimed water line utilize reclaimed water for irrigation and other non-potable uses (Maui County Code Title 20, Chapter 20.30.020A);
- 4) A water waste prohibition with provision for discontinuation of service where negligent or wasteful use of water exists (Maui County Code Title 14, Chapter 14.03.050);
- 5) A provision enabling the Water Director to enact special conservation measures in order to forestall water shortages (Maui County Code Title 14, Chapter 14.06.020).

In addition, a comprehensive conservation ordinance has been drafted, is planned to be included as part of the Maui Island Water Use and Development Plan and may be implemented in stages (Maui County Code Title 14, Chapters 14.02 and 14.03)

### **(5) Public Education & Outreach Activities**

- Public Advertising - Conservation marketing efforts include public ads that run on all cable TV and local radio stations and newspapers to encourage water conservation. (See Table 4)

## Na WaiEha

### Maui County DWS Water Conservation Public Outreach and Education Activities [Table 4]

| Water Conservation Outreach Measure | Cost                                      | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Public newspaper ads                |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Public radio ads                    |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Local TV and cable stations         |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Annual DWS poster contest           | \$25,000 in expenses<br>\$5,715 in prizes | The poster is on file on file. A total of 1,713 public, private and home schooled students participated in the last four years. Costs incurred on supplies, certificates, advertising and printing of calendars and other misc. expense.                                                                                                                                                                                                                            |
| Native plant give away              |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Community Gardens                   | \$25,400 (does not include staff labor)   | DWS supported the community gardens with native plants, irrigation materials, installation and staff time.<br><ul style="list-style-type: none"> <li>• La Hale O Ke Ola</li> <li>• Maui College Student Community Garden</li> <li>• Lahaina High School Garden Project</li> <li>• Greenhouse</li> <li>• Portola High School</li> </ul> (2) Water Conservation specialists spent 20% of their time per month as well as 36 hours of weekend OT for the past 2 years. |

NOTE: native plants come through grant funding with the Maui Nui Botanical Gardens. Since 2003, they have received \$480,000 watershed grant funds from the DWS.

## Na WaiEha

- Permit Review - The permit review process is also utilized as an educational tool, with use-specific conservation and site specific recommendations included in each review.
- Community Events - The DWS participates in about 25 public events per year, such as the County Fair, Earth Day and Taro festivals. (See Table 4)
- In order to provide demonstration and an ongoing educational facility with demonstration and participatory learning, the DWS funds the operations of The Maui Nui Botanical Gardens. (See Table 1)
- Expanded education and marketing efforts under consideration include targeted marketing survey and campaign development, a hotel awards program, a building manager users group, and an agricultural users group.

**Maui County Department of Water Supply Participation in Community  
Public Education and Outreach Events  
[Table 5]**

| COMMUNITY EVENT                      | FREQUENCY OF PARTICIPATION |
|--------------------------------------|----------------------------|
| Arbor Day                            | every year                 |
| Earth Day                            | every year                 |
| Earth Day - Molokai                  | 4/21/06; 4/18/08; 4/17/09  |
| East Maui Taro Festival              | 4/1/06; 4/26/08            |
| Grand Wailea Health Fair             | 8/29/08; 9/18/09           |
| Green Day at Four Seasons Hotel      | 6/5/2008                   |
| Haiku Community Assn Fair            | 3/11/2006                  |
| Haiku's Hoolaulea & Flower Fair      | 3/8/2008                   |
| Haiku's Mahalo Day                   | 11/26/05; 3/11/06          |
| Healthy Hawaii Expo                  | 5/6/06; 6/16/07            |
| Kihikihi Children's Youth Fair       | 10/18/08; 10/17/09         |
| Kulamalu Fun Run                     | 9/17/2005                  |
| Marriott Wailea Health Fair          | 4/29/2009                  |
| Maui Assn of Landscape Professionals | 11/12/05; 11/11/06         |
| Maui County Centennial Celebration   | 8/20/2005                  |
| Maui County Fair                     | every year                 |
| Maui Meadows HOA                     | 9/4/2008                   |
| MCA Home Expo                        | every year                 |
| MECO in Our Community                | every year                 |
| MNBS Native Plant Sale               | every year                 |

## Na Wai Eha

|                               |                                      |
|-------------------------------|--------------------------------------|
| Molokai Health Fair           | 12/3/2005                            |
| Napuwai Health Fair - Molokai | 11/18/06; 12/1/07;<br>11/22/08       |
| Old Lahaina Luau Fair         | 12/17/2008                           |
| S Maui Sustainability Fair    | 8/11/06; 10/9/08                     |
| Ulu Palakua Thing             | 4/30/2005                            |
| Kula Community Assn Fair      | 2/21/2009                            |
| Upcountry Rotary Club Fair    | 4/23/2005                            |
| Upcountry Safe Water Fair     | 6/11/05; 2/21/09; 6/5/10             |
| Upcountry Sustainability fair | 8/1/2006                             |
| Waihee School Fair            | 1/30/2008                            |
| West Maui Safety Fair         | 4/9/05; 2/21/09; 6/5/10              |
| West Maui Senior fair         | 10/7/2009                            |
| Whale Day                     | 2/16/2008                            |
| Women's Health Fair           | 8/26/06; 9/1/07; 9/13/08;<br>9/19/09 |

**(6) Water Conservation and Landscaping:** Located in Wailuku, Maui DWS co-funds operations of the Maui Nui Botanical Gardens, and funded construction of its nursery and portions of other facilities and displays. (see Table 1) This provides a resource for promoting expertise in propagating and maintaining native plant materials, helps to increase the potential marketability of appropriate native plants, promotes a water conservation ethic, provides training on appropriate propagation, planting, irrigation and maintenance techniques, and generally helps to increase the likelihood of successful appropriate landscapes with a "Hawaiian Sense of Place". It also helps to protect watersheds by promoting native and non-invasive plants over potentially invasive species, providing for educational opportunities on the importance of the watershed and how to protect it, and serving as a major demonstration and educational facility. The nursery is also a source of native plants for Department outreach projects and give-aways. (See Table 5)

DWS developed (with help from the County arborist committee) and disseminated a brochure entitled "Saving Water in your Yard, What and How to Plant in your Area", which is distributed by the Maui Nui Botanical Garden as well as by the Department at events and with permit reviews. Future plans for landscape conservation include a conservation ordinance, landscape audit and retrofit program and smaller satellite demonstration projects. DWS is also investigating the costs and benefits of major capital expenditure in reclaimed water transmission to offset use of potable water in South Maui landscapes. The pending conservation ordinance includes mandatory watering schedules and irrigation efficiency measures among other requirements.

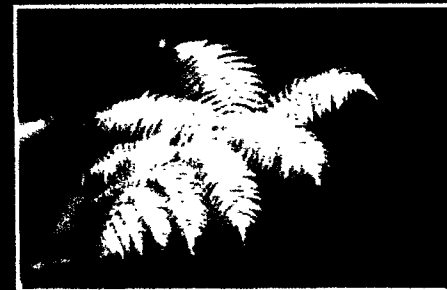
**Ongoing Water Conservation Planning Efforts:** Source options considered as part of the Water Use and Development Plan process will include consideration of extensive

## Na WaiEha

---

conservation measures as a source supply. In order to displace or delay source development an aggressive program is required. Preliminary design of such a program is ongoing as part of the Water Use & Development Plan process. 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 user groups, such as a hotel awards program, a building manager information program, agricultural user working groups/services, as well as energy production and efficiency measures, continued watershed protection and restoration and possible major capital expenditure to support reclaimed water use.

# PAUKŪKALO-WAI`EHU KOU



JUNE 2010

DEPARTMENT OF HAWAIIAN HOME LANDS



## Contents

Kaulana H.R. Park  
Chairman  
Hawaiian Homes Commission

COMMISSIONERS  
Perry Artates (Maui)  
Donald Chang (O'ahu)  
Stuart Keahiahi Hanchett (Kaua'i)  
Malia Patrice Kamaka (West Hawai'i)  
Francis Kahoku Lum (O'ahu)  
Trish Morikawa (O'ahu)  
Alapaki Nahale'a (East Hawai'i)  
Henry K. Tancayo (Moloka'i)

Anita S. Wong  
Deputy to the Chairman

Robert J. Hall  
Executive Assistant

DEPARTMENT OF HAWAIIAN HOME LANDS  
91-5420 Kapolei Parkway  
Kapolei, Hawai'i 96707

[www.hawaii.gov/dhhl](http://www.hawaii.gov/dhhl)

Chairman's Office  
Telephone: (808) 620-9501  
Facsimile: (808) 620-9529

Mailing Address:  
P.O. Box 1879  
Honolulu, Hawai'i 96805

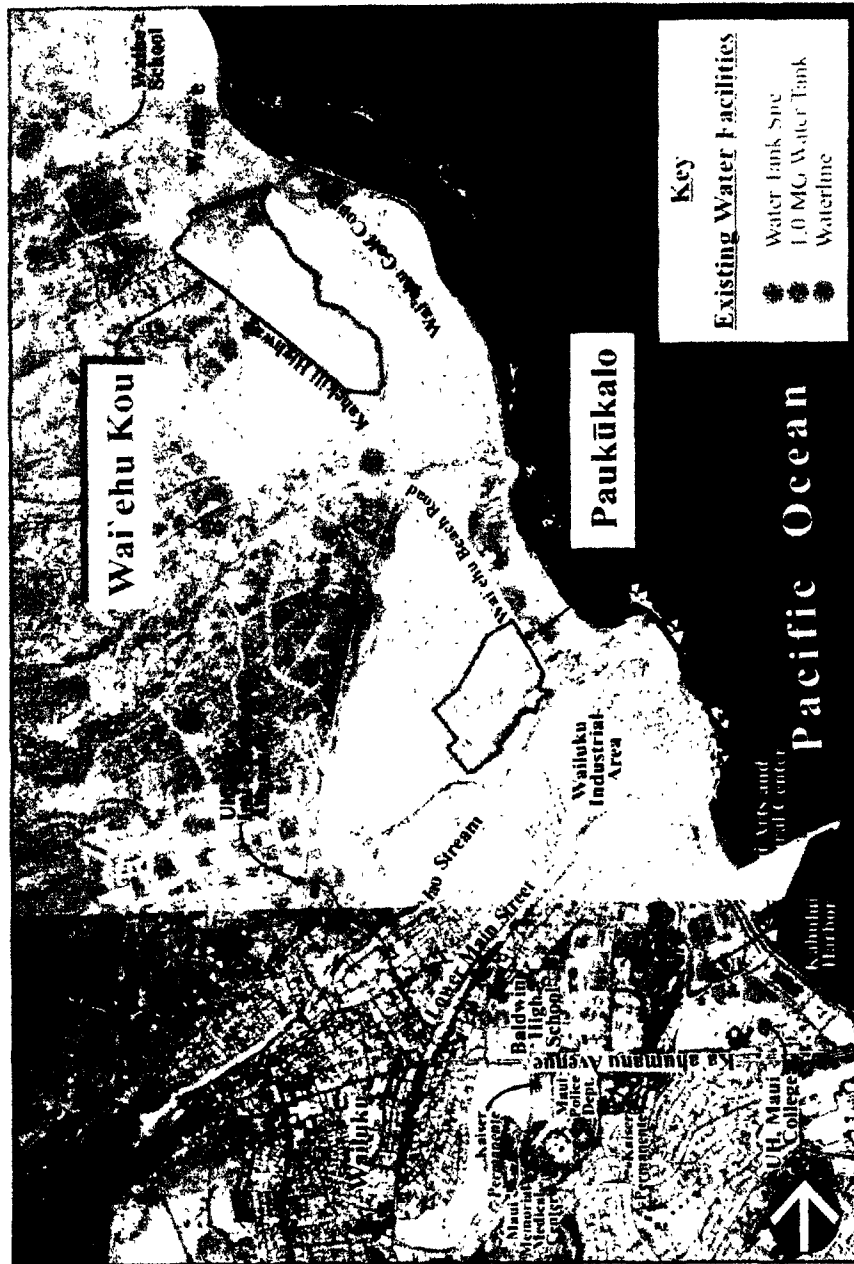
Planning Office  
Telephone: (808) 586-3836  
Facsimile: (808) 586-3843

|                                                                                                              |         |
|--------------------------------------------------------------------------------------------------------------|---------|
| <b>I. INTRODUCTION</b>                                                                                       |         |
| Regional Plan Goals and Process                                                                              | 1 - 2   |
| DHHL Partnering Benefits and Examples                                                                        | 3 - 4   |
| <b>II. HOMESTEAD HIGHLIGHTS</b>                                                                              |         |
| Community Stakeholders                                                                                       | 5 - 6   |
| Elected Officials and Political Boundaries                                                                   | 7 - 8   |
| <b>III. REGIONAL LAND AND DEVELOPMENT</b>                                                                    |         |
| Cultural and Natural Resources                                                                               | 9 - 10  |
| Major Land Owners Map                                                                                        | 11      |
| Hawaiian Home Lands Area                                                                                     | 12      |
| Development Projects Map and Characteristics                                                                 | 13 - 14 |
| Regional Development Characteristics, Trends, and Demographics                                               | 15 - 16 |
| <b>IV. INFRASTRUCTURE</b>                                                                                    |         |
| Water                                                                                                        | 17 - 18 |
| Drainage                                                                                                     | 19 - 20 |
| Flood Zone Maps                                                                                              | 21 - 22 |
| Wastewater                                                                                                   | 23 - 24 |
| Roads                                                                                                        | 25 - 26 |
| Regional Services and Public Facilities                                                                      | 27 - 28 |
| <b>V. HOMESTEAD PRIORITIES</b>                                                                               |         |
| Homestead Priorities                                                                                         | 29      |
| Issues and Opportunities                                                                                     | 30      |
| Priority Projects Map and Characteristics                                                                    | 31 - 32 |
| Priority Project - Paukukalo Armory Site Development                                                         | 33 - 34 |
| Priority Project - Investigate Feasibility of Use of Wai'ehu Kou Vacant Lands between Wai'ehu Kou III and IV | 35 - 36 |
| Priority Project - Address Traffic Congestion and Transportation Needs                                       | 37 - 38 |
| Priority Project - Address Drainage Issue at Paukukalo                                                       | 39 - 40 |
| Priority Project - Identify Community Economic Development Uses at Pu'ene                                    | 41 - 42 |
| Priority Project - Identify Sites for a Potential Community Center at Wai'ehu Kou                            | 43 - 44 |

WAI'EHU KOU PAUKUKALO



# WATER INFRASTRUCTURE MAP



## PROPOSED WATER IMPROVEMENTS

- Maui County, Department of Water Supply (DWS) is investigating a number of initiatives to increase source supply for the Central Maui Water System. Nearing completion, the Central Maui Water Use and Development Plan explores a number of options for potential potable water sources including North Waihe'e and Maluhia Well Systems. A draft of the plan was completed in 2009 and is currently pending review by the County Council.
- The DWS is also currently undertaking a monitoring and modeling study for the Central Maui System, including a status check on the I'ao and Waihe'e Aquifer systems, groundwater recharge and flow modeling to simulate existing conditions, assess various withdrawal scenarios and investigate additional sources of groundwater in Central Maui.
- A&B Properties, Inc., in collaboration with the DWS, proposes the Waiale Water Treatment Facility (WTF), expected to yield approximately 9 million gallons per day (mgd) sourced from the Hopoi Chute. A Final Environmental Impact Statement (EIS) was approved by the DWS and filed on April 2010.
- According to the County of Maui 6-year Capital Improvement Program (CIP) for the Wailuku-Kahului area, new source developments include the development of the I'ao and Waikapu Tank Site Wells. An exploratory well at the I'ao Tank Site was completed in 2005. That same year, DWS also completed the expansion of the I'ao Water Treatment Plant (WTP) with the addition of a third microfiltration unit, in addition to restoring the I'ao 3 million gallon (MG) storage tank.
- Drilling of the Waikapu Tank Site Well was completed in 1999. Design of the well pump installation is currently in progress, and construction is planned to commence in 2008. Development of the Waikapu Tank Site Well is intended to improve the distribution of I'ao Aquifer withdrawals.
- In calendar year 2006, two hundred fifty-three (253) water meter reservations were issued by DWS; two hundred thirty-seven (237) of these were issued to the Department of Hawaiian Homelands (DHHL) (94 percent).

## EXISTING WATER INFRASTRUCTURE

Water service to the area is provided by the County of Maui, DWS. The Department's Central Maui System supplies water to the Waihe'e, Wai'ehu and Paukūkalo areas, as well as to the areas of Wailuku, Kahului, Pala and South Maui. The majority of the Central Maui water supply is drawn from the I'ao and Waihe'e Aquifers (approximately 17 million gallons per day (MGD) and 5 MGD, respectively). This supply is supplemented by water drawn from the Kepaniwai Well, I'ao Tunnel, and the I'ao-Waikapu Ditch (approximately 3.5 MGD).

## EXISTING WATER INFRASTRUCTURE

(continued)

Effective July 21, 2003, the I'ao Aquifer was designated as a ground water management area by the State of Hawai'i, Commission on Water Resource Management (CWRM). Under this designation, no person shall make a withdrawal, diversion, impoundment, or consumptive use of ground water in the I'ao Aquifer System without a permit from the CWRM. CWRM decides how much water is available to be pumped from the I'ao Aquifer, DWS decides on the water distribution.

It is also noted that the CWRM is currently reviewing Interim Instream Flow Standards (IIFS) for the Nā Wai 'Eha (Four Streams) of the Wailuku/Waihe'e/Waikapu area. The four (4) streams included in the Nā Wai 'Eha is I'ao Stream, Waihe'e Stream, Wai'ehu Stream and Waikapu Stream. Two (2) streams are located in proximity to the Wai'ehu Kou-Paukūkalo homestead areas, I'ao Stream and Waihe'e Stream. There are existing stream diversions to utilize the water from the streams for potable and agricultural uses. A decision by the CWRM on the IIFS will determine how much water will be returned to the streams to encourage stream restoration. The beneficiaries of the Wai'ehu Kou and Paukūkalo homesteads support the efforts to restore stream flows to the Nā Wai 'Eha streams.

Water capacity for Central Maui is an extremely important issue. In reaction to the ever present threat of water shortages, according to State Land Use Commission (LUC) Docket No. A05-755, DWS will not issue reservations for water meters until new water sources are brought online.

### 300,000 Gallon Water Tank

There is an existing 300,000 gallon concrete water storage tank, located southwest of the Wai'ehu Kou homestead. The tank was installed as part of the Wai'ehu Heights subdivision, located south of the Wai'ehu Kou homestead. The tank is part of the existing DWS water infrastructure.

### 1.0 Million Gallon Water Tank and Waterline

There is an existing 1.0 million gallon (MG) concrete water storage tank, located further west of the 300,000 gallon tank at an elevation of approximately 490 feet. In addition, there are existing 8-inch and 12-inch waterlines installed in the Kahekili Highway fronting the Wai'ehu Kou homestead. Water infrastructure has been installed in Wai'ehu Kou Phase I, Phase II, Phase III and Phase IV.

### Waterlines

There are existing 8-inch and 12-inch waterlines installed in the Kahekili Highway fronting the Wai'ehu Kou homestead. Water infrastructure has been installed in Wai'ehu Kou Phase I, Phase II, Phase III and Phase IV.



## News Release

### Alexander & Baldwin Announces Transition Of Hawaiian Commercial & Sugar Company To A Diversified Farm Model

HONOLULU, Jan. 6, 2016 /PRNewswire/ -- Alexander & Baldwin, Inc. (NYSE: ALEX) ("A&B" or "Company") today announced that it is transitioning out of farming sugar and will instead pursue a diversified agricultural model for its 36,000-acre Hawaiian Commercial & Sugar Company ("HC&S") plantation on Maui. Sugar operations will be phased out by the end of 2016, and the transition to a new model will occur over a multi-year period. No immediate layoffs will result from today's announcement, and approximately half of the 675 employees will be retained through the end of the sugar harvest, which is expected to be completed late in 2016. Beginning in March, employees will be laid off as their specific functions are completed. Under the new diversified model, the plantation is planned to be divided up into smaller farms with varied agricultural uses, potentially including energy crops, food crops, support for the local cattle industry, and the development of an agriculture park.



## ALEXANDER & BALDWIN, INC.

"A&B's roots literally began with the planting of sugar cane on 570 acres in Makawao, Maui, 145 years ago," said Stanley M. Kuryama, A&B executive chairman. "Much of the state's population would not be in Hawaii today, myself included, if our grandparents or great-grandparents had not had the opportunity to work on the sugar plantations. A&B has demonstrated incredible support for HC&S over these many years, keeping our operation running for 16 years after the last sugar company on Maui closed its doors. We have made every effort to avoid having to take this action. However, the roughly \$30 million Agribusiness operating loss we expect to incur in 2015, and the forecast for continued significant losses, clearly are not sustainable, and we must now move forward with a new concept for our lands that allows us to keep them in productive agricultural use."

"This is a sad day for A&B, and it is with great regret that we have reached this decision," said Christopher J. Benjamin, A&B president and chief executive officer, who ran HC&S as its general manager from 2009 to 2011. "Having had the privilege of working alongside the employees of HC&S for two years, I know firsthand the professionalism and dedication with which they perform their jobs. The longevity of the plantation is a testament to their resourcefulness and hard work. This transition will certainly impact these employees and we will do everything we can to assist them. The cessation of sugar operations also will have a significant impact on the Maui community and we will do our best to minimize that impact. A&B remains committed to Maui and will continue to be a significant corporate supporter of Maui charities and organizations."

#### Employee Transition & Support

A&B is committed to supporting its impacted employees. The Company will provide transition coordinators to assist HC&S employees in finding alternate employment opportunities. The coordinators will identify and coordinate available federal, state, county and private job assistance programs (including employment counseling, job training, financial counseling, job placement and education services). A&B will offer all employees enhanced severance and benefit packages. Retirement benefits accrued by eligible employees, retirees, and past employees will not be affected by the transition out of sugar. Additionally, the Company will consider displaced employees for positions in its new operations as they become available.

"We are very focused on helping our employees during this time," Benjamin said. "Many of our employees have dedicated their careers to HC&S and have followed in the footsteps of previous generations of family members that worked on the plantation. We are grateful for their years of service and we will support them through this transition period."

#### Transition to Diversified Agriculture

"A&B is committed to looking for optimal productive agricultural uses for the HC&S lands," said Benjamin. "Community engagement, resource stewardship, food sustainability, and renewable energy are all being considered as we define the new business model for the plantation. These are leading us toward a more diversified mix of operations."

The Company is evaluating several categories of potential replacement agricultural activities. These include energy crops, agroforestry, grass-finished livestock operations, diversified food crops, and orchard crops, among others.

HC&S has several test projects underway to further assess these opportunities, and the Company plans to expand the scope and scale of the trials during the coming year. Initial projects include:

- **Energy crops:** Building upon its extensive experience with crop-to-energy production, HC&S has initiated crop trials to evaluate potential sources of feedstock for anaerobic conversion to biogas. This on-farm testing currently is being expanded from plot to field-scale and HC&S has entered into a confidential memorandum of understanding with local and national partners to explore market opportunities for biogas. HC&S also is assessing the potential of cultivating purpose-grown oilseed crops for biodiesel production and has entered into preliminary, but confidential, discussions with other bioenergy industry players to explore additional crop-to-energy opportunities.
- **Support for the local cattle industry:** The Company is exploring the costs and benefits of irrigated pasture to support the production of grass-finished beef for the local market. HC&S has converted a test site of former sugar land to cultivated pasture and is working with Maui Cattle Company to conduct a grass-finishing pasture trial in 2016. High-quality grazing lands could enable Maui's cattle ranchers to expand their herds and keep more cattle in Hawaii for finishing on grass.
- **Food crops/Agnculture park:** A&B plans to establish an agnculture park on former sugar lands in order to provide opportunities for farmers to access these agricultural lands and support the cultivation of food crops on Maui. HC&S employees will be given preference to lease lots from the company to start their own

farming operations.

"Transitioning HC&S to a diversified agribusiness model underscores A&B's commitment to the community and our intention to keep these lands in active agricultural use," said Benjamin. "It will take time but, if successful, these efforts could support the goals of food and energy self-sufficiency for Hawaii, preserve productive agricultural lands, and establish new economic engines for Maui and the state."

#### ABOUT HAWAIIAN COMMERCIAL & SUGAR

Hawaiian Commercial & Sugar Company is the state's largest farm, with 36,000 acres under cultivation. The Company also generates enough electricity, primarily from renewable sources, to be 100% energy self-sufficient. For more information, please visit [www.hcsugar.com](http://www.hcsugar.com).

#### ABOUT ALEXANDER & BALDWIN

Alexander & Baldwin, Inc. is a Hawaii-based public company, with interests in real estate development, commercial real estate, agriculture, materials and infrastructure construction. With ownership of over 88,000 acres in Hawaii, A&B is the state's fourth largest private landowner, and one of the state's most active real estate investors. The Company manages a portfolio comprising five million square feet of leasable space in Hawaii and on the U. S. Mainland and is the second largest owner of retail assets in the state. A&B also is Hawaii's largest materials company and paving contractor. Additional information about A&B may be found at [www.alexanderbaldwin.com](http://www.alexanderbaldwin.com).

#### FORWARD-LOOKING STATEMENTS

Statements in this press release that are not historical facts are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, that involve a number of risks and uncertainties that could cause actual results to differ materially from those contemplated by the relevant forward-looking statement. These forward-looking statements are not guarantees of future performance. This release should be read in conjunction with pages 17-30 of Alexander & Baldwin, Inc.'s 2014 Form 10-K and other filings with the SEC through the date of this release, which identify important factors that could affect the forward-looking statements in this release. We do not undertake any obligation to update our forward-looking statements.

Contact:  
Stacy Hollinger  
808.525.8422  
[shollinger@abinc.com](mailto:shollinger@abinc.com)

Logo: <http://photos.pmnewswire.com/prnh/20120801/LA50085/LOGO>

To view the original version on PR Newswire, visit <http://www.pmnewswire.com/news-releases/alexander-baldwin-announces-transition-of-hawaiian-commercial-sugar-company-to-a-diversified-farm-model-300200325.html>

SOURCE: Alexander & Baldwin, Inc.

**Bid Number:** DWS Job No. 12-03  
**Bid Title:** Iao Surface Water Treatment Plant Upgrades, Island of Maui, Hawaii  
**Category:** Construction - All Construction  
**Status:** Open

**Description:****NOTICE TO BIDDERS**

SEALED BIDS for IAO SURFACE WATER TREATMENT PLANT UPGRADES, DWS JOB NO. 12-03, ISLAND OF MAUI, STATE OF HAWAII, will be received by the Director of the Department of Water Supply, Kalana O Maui Building, 5th Floor, 200 South High Street, Wailuku, Maui, Hawaii 96793, until 2:00 PM ON TUESDAY, MARCH 8, 2016, at which time and place sealed bids will be publicly opened and read aloud.

The project involves furnishing all labor, tools, materials and equipment towards construction of a surface water treatment plant that utilizes a micro-filtration process.

A compact disk (CD) containing the bid documents for this Iao Surface Water Treatment Plant Upgrades project may be purchased from the Engineering Division of the Department of Water Supply at a cost of TEN DOLLARS (\$10.00). There will be no refund for these bid documents once they are purchased. Payment shall be in the form of cash, check or money order payable to "Department of Water Supply".

An initial pre-bid conference and project tour has been scheduled at 9:00 AM ON TUESDAY, FEBRUARY 2, 2016. All Bidders ARE ENCOURAGED to attend. As this pre-bid conference will include detailed discussions on the SCADA System, due to a significant amount of associated control system work, consideration should also be given to attendance by potential electrical subcontractors. Bidders shall meet at the Department of Water Supply's NASKA Baseyard Office at 614 Palapala Drive, Kahului, Maui.

A second pre-bid conference has been scheduled at 9:00 AM ON TUESDAY, FEBRUARY 16, 2016, at the NASKA Baseyard, at which time follow-up discussions to the first pre-bid will be held, including matters pertaining to the SCADA system.

Bidders planning to attend the pre-bid conference(s) are requested to call 808-270-7835 and inform the Department of Water Supply of their intent to attend the conference(s) at least THREE (3) days prior to the date of each pre-bid conference.

To be eligible to bid, bidders shall possess applicable and valid State of Hawaii contractor's licenses to perform the work. Bidders must NOT be more than 180 days over the Contract Time (without approved Time Extensions) on any current Department of Water Supply Capital Improvement Projects. This includes subsidiary companies.

Bids must be accompanied by an acceptable form of bid security in an amount not less than five percent (5%) of the amount of the base bid, including additives, payable to the "Department of Water Supply" and in compliance with Section 103D-323, Hawaii Revised Statutes, as amended.

Danilo Agsalog, Director  
Department of Finance  
County of Maui

www.co.maui.hi.us (posted January 7, 2016)

**Publication Date/Time:**

1/7/2016 3:00 PM

**Closing Date/Time:**

3/8/2016 2:00 PM

**Pre-bid Meeting:**

See Notice to Bidders

**Contact Person:**

Engineering Division, Department of Water at 808-270-7835.

**Plan & Spec Available:**

See Notice to Bidders

**Business Hours:**

7:45 am to 4:30 pm

[Return To Main Bid Postings Page](#)

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

Surface Water Use Permit Applications, ) Case No.. CCH-MA15-01  
Integration of Appurtenant Rights and )  
Amendments to the Interim Instream Flow ) CERTIFICATE OF SERVICE  
Standards, Na Wai Eha Surface Water )  
Management Areas of Waihee, Waiehu, Iao and )  
Waikapu Streams, Maui )  
\_\_\_\_\_)

**CERTIFICATE OF SERVICE**

On February 5, 2016, a copy of the foregoing document was served on the following parties  
by U.S. mail, postage prepaid, or electronic service, as indicated below:

Commission on Water Resource Management  
1151 Punchbowl Street, Room 227  
Honolulu, Hawaii 96813  
(by email: kathy.s.yoda@hawaii.gov)

SERVICE BY MAIL

Noelani & Alan Almeida  
Gordon Almeida  
P.O. Box 1005  
Wailuku, HI 96793

Joseph Alueta  
P.O. Box 785  
Wailuku, HI 96793

Michael Bailie  
PO Box 1433  
Wailuku, HI 96793

Vernon Bal  
230 Koeli Street  
Wailuku, HI 96793

Dorothy Bell  
1419 Nuna Place  
Waikapu, HI 96793

Dwayne Betsill  
Koolau Cattle Company, LLC  
635 Kenolio Road  
Kihei, HI 96753

Alan Birnie  
175 W. Waiko Road  
Wailuku, HI 96793

Gary & Evelyn Brito  
2160A Puuohala Road  
Wailuku, HI 96793

David & Anne Brown  
2525 Kahekili Hwy.  
Wailuku, HI 93793-9233

Douglas Myers  
1299 Malaihi Road  
Wailuku, HI 96793

Regino Cabacungan  
304 Hoomalu Place  
Wailuku, HI 96793

Thomas Cerizo  
1740 Kamamalu Place  
Wailuku, HI 96793

Cordell Chang  
2315 Kahekili Hwy.  
Wailuku, HI 96793

Joshua Chavez  
P.O. Box 6240  
Kahului, HI 96733

Winifred and Gordon Cockett  
1159 Piihana Road  
Wailuku, HI 96793

Pauline Kanegai Curry  
P.O. Box 3172  
Wailuku, HI 96793

Charles Dando, Sr. & Jr.  
85 E. Kanamele Loop  
Wailuku, HI 96793

Alfred & Patricia DeMello  
El Ranchitos DeMello  
P.O. Box 1394  
Lockeford, CA 95237

James Dodd  
P.O. Box 351  
Wailuku, HI 96793

Michael Doherty  
41 Waihee Valley Road  
Wailuku, HI 96793

Richard Emoto  
2032 B Ulei Lane  
Wailuku, HI 96793

Patricia Federcell  
88 S Papa Avenue, Apt. 404  
Kahului, HI 96732-3307

Rudy & Perlita Fernandez  
P.O. Box 330808  
Kahului, HI 96733

Roderick Fong  
Fong Construction Company  
Inc.  
495 Hukilike Street, Bay 4  
Kahului, HI 96732

Dave Gomes  
Hawaiian Cement - Maui  
Concrete and Aggregate  
Division  
P.O. Box 488  
Kahului, HI 96732

Russel Gushi  
185 West Waiko Road  
Wailuku, HI 96793

Valentine Haleakala  
2160 Puuohala Road  
Wailuku, HI 96793

Steve Haller  
1060 East Kuiaha Road  
Haiku, HI 96708

Robert Hanusa  
895 Malaihi Road  
Wailuku, HI 96793

Darrell Higa  
918 Kanakea Loop  
Lahaina, HI 96761

George & Yoneko Higa  
592 S. Papa Avenue  
Kahului, HI 96732

Paul and Jennifer Higashino  
P.O. Box 239  
Wailuku, HI 96793

Hiolani Ranch LLC  
P.O. Box 34167  
San Diego, CA 92163

Brian Ige  
RCFC Kehalani, LLC  
2005 Main Street  
Wailuku, HI 96793

Greg Ibara  
227 Kawaipuna Street  
Wailuku, HI 96793

Ronald Jacintho  
Pohakulepo Recycling, LLC  
150 Pakana Street  
Wailuku, HI 96790

Ronald Jacintho  
ROJAC Trucking, Inc.  
150 Pakana Street  
Wailuku, HI 96793

Amanda Jones  
Spencer Homes Inc.  
P.O. Box 97  
Kihei, HI 96753

Kaanapali Kai, Inc.  
2145 Wells Street  
Suite 3301  
Wailuku, HI 96793

Kaui Kahalekai  
202 Waihee Valley Road  
Wailuku, HI 96793

Kenneth Kahalekai  
240 Waihee Valley Road  
Wailuku, HI 96793

Alfred Kailiehu Sr.  
Alfred Kailiehu, Jr.  
3660 Kahekili Hwy.  
Wailuku, HI 96793

Leinaala Kihm  
1415 Honua Place  
Wailuku, HI 96793

Sterling Kim  
Hale Mua Properties, LLC  
250 Alamaha Street, Suite  
N18  
Kahului, HI 96732

Clifford & Cristal Koki  
P.O. Box 442  
Wailuku, HI 96793

Lawrence Koki  
2585 Kahekili Highway  
Wailuku, HI 96793

Mary Jane Kramer  
Na Mala o Waihee Private  
Water Co. Inc.  
c/o Commercial Properties of  
Maui Management, Inc.  
1962-B Wells Street  
Wailuku, HI 96793

Donald Kuemmeler  
RCFC Kehalani, LLC  
555 California Steet, Suite  
3450  
San Francisco, CA 94104

Jonathon Kurtz  
Living Waters Land  
Foundation, LLC  
P.O. Box 2327  
Wailuku, HI 96793

Jane Laimana  
45-520 Alokahi Street  
Kaneohe, HI 96744

Cindy Lee, Managing Agent  
Waiolani Mauka Community  
Association, Inc.  
c/o Scott Nunokawa  
P.O. Box 946  
Wailuku, HI 96793

David & Katherine Lengkeek  
128 River Road  
Wailuku, HI 96793

Nadao Makimoto  
1480 Honoapiilani Highway  
Wailuku, HI 96793-5930

Anthony Manoukian  
Anthony Aram & Downey  
Rugtiv Manoukian Tr.  
P.O. Box 1609  
Waianae, HI 96792

Glenn McLean  
350 West Waiko Road  
Wailuku, HI 96793

Kenneth Mendoza  
2160 B Puuohala Road  
Wailuku, HI 96793-0463

Lawrence Miyahira  
Jason Miyahira  
P.O. Box 762  
Wailuku, HI 96793

Elsie Miyamoto  
1455 Miloiki Street  
Honolulu, HI 96825-3229

Jinsei Miyashiro Trust  
P.O. Box 235  
Wailuku, HI 96793

Glynnis Nakai  
Maui National Wildlife  
Refuge Complex, USFWS  
P.O. Box 1042  
Kihei, HI 96753

Lester Nakama  
Aloha Poi Factory, Inc.  
800 Lower Main Street  
Wailuku, HI 96793

David Niehaus  
1630 Piiholo Road  
Makawao, HI 96768

David Nobriga  
Nobriga's Ranch Inc.  
P.O. Box 1170  
Wailuku, HI 96793

Nelson Okamura  
Kihei Gardens &  
Landscaping Co. LLP  
P.O. Box 1058  
Puunene, HI 96784

Francis Ornellas  
340 Iao Valley Road  
Wailuku, HI 96793

Ken & Saedene Ota  
2261 Aupuni Street  
Suite 101  
Wailuku, HI 96793

Kalani & Tera Paleka  
P.O. Box 342  
Wailuku, HI 96793

Robert Pinto  
c/o Claire Pinto  
130 Pilikana Place  
Wailuku, HI 96793

Milla Richardson  
94 Laukahi Street  
Kihei, HI 96753

Isabelle Rivera  
P.O. Box 634  
Wailuku, HI 96793

Katherine Riyu  
P.O. Box 696  
Wailuku, HI 96793

Waldemar & Darlene Rogers  
1421 Nuna Place  
Wailuku, HI 96793

Peter Fritz  
107 Waihee Valley Rd.  
Wailuku, HI 96793

Alfred Santiago & Colin  
Kailiponi  
2445C Vineyard St.  
Wailuku, HI 96793

Ione Shimizu  
219-K West Waiko Road  
Wailuku, HI 96793

Donnalee & David Singer  
P.O. Box 3017  
Wailuku, HI 96793

Kurt & Betsy Sloan  
P.O. Box 310  
Kihei, HI 96753

Warren Soong  
245A West Waiko Road  
Wailuku, HI 96793

Yoshie Suehiro & Natalie  
Hashimoto  
915 Malaihi Road  
Wailuku, HI 96793

Takitani Agaran & Jorgensen  
Wailuku Executive Center  
24 N Church Street, Ste 409  
Wailuku, HI 96793

Noel & Katherine Texeira  
P.O. Box 2846  
Wailuku, HI 96793-7846

Thomas & Patricia Texeira &  
Denise Texeira  
205 Waihee Valley Road  
Wailuku, HI 96793

Waldo Ullerich  
Emmanuel Lutheran Church  
& School  
P.O. Box 331194  
Kahului, HI 96733

Melvin Riyu & Judith  
Yamanoue  
PO Box 696  
Wailuku, HI 96793

#### ELECTRONIC SERVICE

Douglas Bell  
1420 Honua Place  
Waikapu, HI 96793

[sandi.doug@hawaiiantel.net](mailto:sandi.doug@hawaiiantel.net)

Francisco Cerizo  
PO Box 492  
Wailuku, HI 96793

[cerizof@gmail.com](mailto:cerizof@gmail.com)

Heinz Jung and Cecilia Chang  
P.O. Box 1211  
Wailuku, HI 96793

[cici.chang@hawaiiantel.net](mailto:cici.chang@hawaiiantel.net)

Jordanella (Jorrie) Ciotti  
484 Kalua Road  
Wailuku, HI 96793

[jorrieciotti@gmail.com](mailto:jorrieciotti@gmail.com)

Fred Coffey  
1271 Malaihi Road  
Wailuku, HI 96793

[hawaii50peleke@yahoo.com](mailto:hawaii50peleke@yahoo.com)

Kathy De Hart  
P.O. Box 1574  
Wailuku, HI 96793

kdehart17@gmail.com

John V. & Rose Marie H. Duey  
Hooululahui LLC  
575 A Iao Valley Rd.  
Wailuku, HI 96793  
cc: Nani Santos

jduey@maui.net

nanisantos808@gmail.com

Stanley Faustino  
c/o Kanealoha Lovato-Rodrigues  
384 Waihee Valley Road  
Wailuku, HI 96793

kanealoha808@gmail.com

William Freitas  
c/o Kapuna Farms LLC  
2644 Kahekili Highway  
Wailuku, HI 96793

kapunafarms@gmail.com

Diannah Goo  
c/o April Goo  
2120 C Kahekili Hwy.  
Wailuku, HI 96793

ag2517@aol.com

Nicholas Harders on behalf of:  
Karl & Lee Ann Harders  
1422 Nuna Pl.  
Wailuku, HI 96793

waikapu@me.com

Theodore & Zelig Harders  
T&Z Harders FAM LTD PTNSHP  
Theodore and Zelig Harders Family Ltd. Partnership  
1415 Kilohi St.  
Wailuku, HI 96793

Evelyn Kamasaki  
Cynthia Ann McCarthy  
Claire S. Kamasaki  
1550 Nukuna Place  
Wailuku, HI 96793

cmcmaui@live.com

Charlene E. and Jacob H. Kana, Sr.  
PO Box 292  
Wailuku, HI 96793

char1151@hawaii.rr.com

Kimberly Lozano  
P.O. Box 2082  
Wailuku, HI 96793

pauahi808@aol.com

Renee Molina  
P.O. Box 1746  
Wailuku, HI 96793

myoheo@yahoo.com

Lorrin Pang  
166 River Road  
Wailuku, HI 96793

pangk005@hawaii.rr.com

Victor and Walette Pellegrino  
1420 Kilohi Street  
Wailuku, HI 96793

hokuao44@msn.com  
Hokuau.pellegrino@gmail.com

L. Ishikawa  
Piko Ao, LLC  
2839 Kalialani Circle  
Pukalani, HI 96768

lorilei@hawaii.edu

Michael Rodrigues  
2518 W. Main Street  
Wailuku, HI 96793

mikerodmaui@yahoo.com

Burt Sakata  
107 Waihee Valley Rd.  
Wailuku, HI 96793

waihee89@yahoo.com

Bryan Sarasin, Sr.  
c/o Bryan Sarasin, Jr.  
P.O. Box 218  
Wailuku, HI 96793

mauifishfarm@hawaiiantel.net

Duke & Jean Sevilla & Christina Smith  
702 Kaae Road  
Wailuku, HI 96793

sevillad001@hawaii.rr.com

Jeff and Ramona Lei Smith  
P.O. Box 592  
Wailuku, HI 96793

ohianui.ohana@gmail.com

Murray and Carol Smith  
P.O. Box 11255  
Lahaina, HI 96761

murray@jps.net

Crystal Smythe  
John Minamina Brown Trust  
727 Wainee Street, Suite 104  
Lahaina, HI 96761

cytl@maui.net

Clayton Suzuki  
Linda Kadosaki  
Reed Suzuki  
Scott Suzuki  
P.O. Box 2577  
Wailuku, HI 96793

csuzuki@wailukuwater.com

John Varel  
191 Waihee Valley Road  
Wailuku, HI 96793

jvarel@fusionstorm.com

Michele and Leslie Vida, Jr.  
135 Pilikana Place  
Wailuku, HI 96793

mikievida@hotmail.com

Leslie Vida, Sr.  
c/o Donna Vida  
125 Pilikana Street  
Wailuku, HI 96793

dmlavida@yahoo.com

Roger and Kevin Yamaoka  
1295 Old Waikapu Road  
Wailuku, HI 96793

rryamaoka@aol.com  
kty@hawaii.rr.com

Colin J. Lau, Esq.  
465 S. King Street, Room 300  
Honolulu, Hawaii 96813

colin.j.lau@hawaii.gov

cc: Russell Kumabe

russell.p.kumabe@hawaii.gov

Holly McEldowney

holly.mceldowney@hawaii.gov

(Department of Land and Natural Resources, Division of State Parks)

Yvonne Izu, Esq.  
Moriwaka Lau & Fong LLP  
400 Davies Pacific Center  
841 Bishop Street  
Honolulu, HI 96813

yizu@moriharagroup.com

cc: Garret Hew

ghew@hcsugar.com

(Hawaiian Commercial & Sugar Co. (HC&S))

Tina Aiu, Esq.  
Oahu Island Director  
Hawaiian Islands Land Trust, HILT  
P.O. Box 965  
Wailuku, HI 96793

christina@hilt.org

cc: Scott Fisher

scott@hilt.org

Isaac Moriwake, Esq.  
Summer Kupau-Odo  
Earthjustice  
850 Richards Street  
Suite 400  
Honolulu, HI 96813

imoriwake@earthjustice.org  
skupau@earthjustice.org  
jbrown@earthjustice.org  
jparks@earthjustice.org

(Hui O Na Wai Eha and Maui Tomorrow Foundation)

Avery & Mary Chumbley  
363 West Waiko Road  
Wailuku, HI 96793  
(Makani Olu Partners LLC)

abc@aloha.net

Jodi Yamamoto, Esq.  
Wil Yamamoto, Esq.  
Yamamoto Caliboso  
1099 Alakea Street  
Suite 2100  
Honolulu, HI 96813

jyamamoto@ychawaii.com  
wyamamoto@ychawaii.com

(MMK Maui, LP, The King Kamehameha Golf Club, Kahili Golf Course)

Pamela Bunn, Esq.  
Alston, Hunt, Floyd & Ing  
1001 Bishop Street, Suite 1800  
Honolulu, HI 96813  
(Office of Hawaiian Affairs)

[pbunn@ahfi.com](mailto:pbunn@ahfi.com)

Craig Nakamura, Esq.  
Catherine L.M. Hall, Esq.  
Carlsmith Ball LLP  
2200 Main Street, Suite 400  
Wailuku, HI 96793  
(Wahi Hoomalu Limited Partnership)

[cnakamura@carlsmith.com](mailto:cnakamura@carlsmith.com)  
[chall@carlsmith.com](mailto:chall@carlsmith.com)

Peter A. Horovitz, Esq.  
Kristine Tsukiyama, Esq.  
Merchant Horovitz LLLC  
2145 Wells Street, Suite 303  
Wailuku, HI 96793  
(Waikapu Properties, LLC and MTP (Maui Tropical Plantation) Operating Company, LLC)  
cc: Albert Boyce

[pah@mhmaui.com](mailto:pah@mhmaui.com)  
[kkt@mhmaui.com](mailto:kkt@mhmaui.com)

[albertboyce@gmail.com](mailto:albertboyce@gmail.com)

Brian Kang, Esq.  
Emi L.M. Kaimuloa  
Watanabe Ing, LLP  
First Hawaiian Center  
999 Bishop Street, 23rd Floor  
Honolulu, HI 96813  
(Wailuku Country Estates Irrigation Company (WCEIC))

[bkang@wik.com](mailto:bkang@wik.com)  
[ekaimuloa@wik.com](mailto:ekaimuloa@wik.com)

Paul R. Mancini, Esq.  
James W. Geiger, Esq.  
Paul Mancini, Esq.  
Mancini, Welch, & Geiger LLP  
RSK Building  
305 Wakea Avenue, Suite 200  
Kahului, HI 96732  
cc: Avery Chumbley  
(Wailuku Water Company, LLC)

[pmancini@mrwlaw.com](mailto:pmancini@mrwlaw.com)  
[jgeiger@mrwlaw.com](mailto:jgeiger@mrwlaw.com)

Lawrence H. Miike  
Hearings Officer  
1151 Punchbowl Street, Room 227  
Honolulu, Hawaii 96813

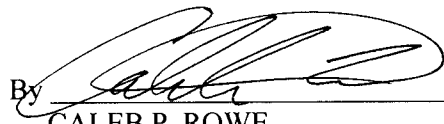
[lhmiike@hawaii.rr.com](mailto:lhmiike@hawaii.rr.com)

Linda L.W. Chow, Esq.  
Deputy Attorney General  
465 S. King Street, Room 300  
Honolulu, Hawaii 96813

[linda.l.chow@hawaii.gov](mailto:linda.l.chow@hawaii.gov)

DATED: Wailuku, Maui, Hawaii, February 5, 2016.

PATRICK K. WONG  
Corporation Counsel  
Attorney for COUNTY OF MAUI  
DEPARTMENT OF WATER SUPPLY

By   
CALEB P. ROWE  
KRISTIN K. TARNSTROM  
Deputies Corporation Counsel