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DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
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STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

March 20, 2013
Honolulu, Hawaii

Request Authority to Implement Water Conservation Programs
Identified in the Hawaii Water Conservation Plan

SUMMARY OF REQUEST

The Staff of the Commission on Water Resource Management ("Commission") requests authorization to:

1. Implement programs for water conservation and efficiency; and
2. Expend up to \$50,000 for this purpose.

BACKGROUND

At its February 17, 2010 meeting, the Commission authorized the Chairperson to enter into a "planning assistance to states agreement" with the U.S. Army Corps of Engineers to develop a statewide "Water Conservation Plan" ("Plan").

The Water Conservation Plan project had three key objectives:

1. Develop a coordinated statewide water conservation planning strategy and policy framework.
2. Establish a water conservation association of water purveyors and stakeholders.
3. Develop a statewide water conservation program to implement the planning and policy framework.

The Hawaii Water Conservation Plan's final report was completed in February 2013 fulfilling these objectives and recommending a suite of water conservation program elements. These were grouped by major water use sectors: municipal, agriculture, military, and golf course. The plan established a preliminary schedule to complete these program elements and estimated funding and staffing requirements (Exhibit 1).

The Plan was developed through a water conservation Advisory Group established at the beginning of the project. The Advisory Group includes industry experts and stakeholders from the major water use sectors, government, and the private sector. The Advisory Group met six (6) times. Each sector's water use was determined using the best available data. The municipal and agriculture water use sectors have the highest water use and the greatest potential for water savings. There are gaps in the water use data that need to be addressed statewide.

The Advisory Group identified and evaluated “best management practices” to improve water use efficiency in the four main sectors. They developed sector-based programs to implement high priority best management practices. The Advisory Group developed a 10-year implementation schedule (Exhibit 2) and policy actions to improve water use efficiency in all water use sectors (Exhibit 3).

WATER CONSERVATION PLAN PRIORITY IMPLEMENTATION ACTIONS

While the Hawaii Water Conservation Plan offers a menu of water conservation program elements, the Commission staff recommends two priority actions for the near-term:

1. Procedures for conducting and requiring annual water loss audit of public water systems; and
2. An irrigation metering demonstration project for agriculture.

The two proposed actions are described below.

1. *Procedures for Conducting and Requiring Annual Water Loss Audit*

Only a few public water systems (“PWS”) conduct systematic water loss audits. Regularly scheduled water loss audits would benefit utilities, increase their revenue, and conserve water. This management practice has not been common in Hawaii. There is a real need for education and outreach in water loss audits and water loss control for public water systems. A program to train public water system managers and operators in a standard methodology would help to meet these needs.

The program proposed here would offer workshops in each county for PWS managers and operators. The Commission could partner with the Hawaii Rural Water Association (“HRWA”) to provide expert training. County municipal water systems could assist with education and training programs. Other project partners could include the American Water Works Association-Hawaii Section (“AWWA”) and the U.S. Army Corps of Engineers. Staff may also seek out other subject matter experts. Training would follow the AWWA water audit and loss control methodology. The program would use existing educational materials available from AWWA and other states that have implemented similar programs.

Following the training, Commission staff will explore ways to require public water systems to conduct water loss audits and submit them to the Commission on an annual or other periodic basis. This will be phased-in over a reasonable time.

2. *Irrigation Metering Demonstration Project*

There is a dearth of water use data from surface water diversions across the state, particularly agricultural uses. It is difficult to measure surface water flows. The methods are not commonly known. There is also a perception that it would be expensive to measure these open channel flows. Without knowledge of how much water is diverted and used, it is difficult to effectively manage water in agricultural operations, ascertain water use efficiency and devise water conservation measures. A program to educate irrigators in simple yet reasonably accurate methods for measuring diverted surface water flows is needed in order to improve the Commission’s surface water use data collection and assist agriculture operators to better manage their water use and efficiency.

This proposed program would offer workshops and demonstration projects to large-scale irrigation system operators and small-scale agricultural operations using stream diversions. The Commission would partner with the respective County Resource Conservation and Development Councils to coordinate and plan the workshops. The U.S. Geological Survey (“USGS”) would provide technical assistance and

training services on ways to measure water flows in open channels. Training would include instructions to install and operate water measurement devices on or near stream diversions. The devices should be inexpensive to install, maintain, and operate.

Staff will work with USGS and other partners to find suitable irrigation systems and agricultural operations with owners willing to host the workshops. These operators may contribute cost-share and in-kind services to install the measurement devices. Other partners could include Hawaii Department of Agriculture, Natural Resources Conservation Service, and the Soil and Water Conservation Districts. After the workshops are completed, the Commission could then begin to enforce the long standing requirement that users submit monthly water use reports.

AUTHORITY

The Commission has the authority to plan and coordinate programs for the conservation of water and authority to account for all water uses. Commission rules require well or stream diversion operators to report their water use on a monthly basis.

Hawaii Revised Statutes (“HRS”) §174C-5 (13), provides that the Commission:

Shall plan and coordinate programs for the development, conservation, protection, control, and regulation of water resources based upon the best available information, and in cooperation with federal agencies, other state agencies, county or other local governmental organizations and other public and private agencies created for the utilization and conservation of water;

HRS §174C-5 (14), further provides that the Commission:

Shall catalogue and maintain an inventory of all water uses and water resources;

Hawaii Administrative Rules §13-168-7 (a) stipulates, in part:

The owner or operator of any well or stream diversion works from which water is being used shall provide and maintain an approved meter or other appropriate device or means for measuring and reporting total water usage on a monthly (calendar or work schedule) basis.

FUNDING

Staff estimates that up to \$50,000 in funding may be needed to implement the two Hawaii Water Conservation Plan program elements described above. Funds will be provided through the Commission’s general fund, special fund, or a combination of both, subject to available funding balances. Implementation of remaining program elements will require additional resources.

ENVIRONMENTAL REVIEW CHAPTER 343, HAWAII REVISED STATUTES

Environmental Assessment (“EA”) Triggers. Under HRS §343-5(a), an EA is required for the use of state funds unless exempted. The proposed actions is exempt from an EA based on HAR §11 -200-8(a), basic data collection, research, experimental management and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource.

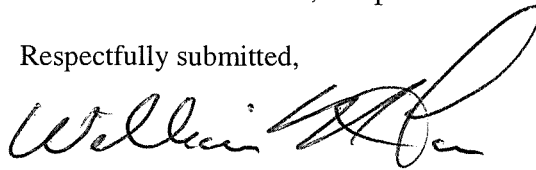
RECOMMENDATIONS

Staff recommends that the Commission:

1. Authorize staff to implement water conservation programs described in the Hawaii Water Conservation Plan and expend up to \$50,000 from the Commission's general fund or special fund (or combination of both), to implement:
 - a. Procedures For Conducting and Requiring Water Loss Audits
 - b. An Irrigation Metering Demonstration Project
2. Authorize the Chairperson to enter into agreements to expend funding in such amounts necessary, up to \$50,000, to implement the programs in Recommendation 1, and to amend or modify the agreements as may be necessary to accomplish the goals described here, provided that any amendment or modification does not require additional Commission funding.
3. Find and determine that the proposed work is exempt from the requirement to prepare an EA.

The terms of any agreements would be subject to the availability of funding and approval of the Chairperson and the Department's Deputy Attorney General. Contract execution will be done in accordance with HRS Chapter 103D and Hawaii Administrative Rules, Chapter 3-122.

Respectfully submitted,



WILLIAM M. TAM
Deputy Director

- Exhibits: (1) Executive Summary, Hawaii Water Conservation Plan
(2) Hawaii Water Conservation Plan Implementation Schedule
(3) Hawaii Water Conservation Plan Other Policy Actions

APPROVED FOR SUBMITTAL:



WILLIAM J. AILA, JR.
Chairperson

Executive Summary

Need for a Water Conservation Plan

As an island state, Hawaii has limited access to natural fresh water supplies. Competition for fresh water, increasing population and development pressures, the rising awareness of environmental water needs, and the impacts of global climate change require that Hawaii become as efficient as possible in its uses of limited fresh water supplies. In some areas of the state, demand for water is approaching the sustainable limits of supply, and these demands are expected to increase in the future. In order to sustain and protect our water for future generations, we must strive to be as efficient as possible in all of our water uses.

The Commission on Water Resource Management (CWRM) is the primary steward of the water resources public trust and has broad powers and responsibilities to protect and manage Hawaii's water resources. This includes the authority and duty to develop plans and programs to conserve water across the State of Hawaii. While various state agencies and municipalities have developed and implemented individual programs to conserve water, there has been a lack of coordination and communication to collaborate those efforts toward a common goal.

Hawaii Water Conservation Plan Purpose

The purpose of the Hawaii Water Conservation Plan is to identify and implement water use and delivery efficiency measures to conserve the fresh water resources of the state. The plan is intended to be a guiding document for the CWRM as they develop and implement water efficiency measures that can be implemented across the state by various water user groups. In "owning" the Hawaii Water Conservation Plan, the CWRM serves as a coordinator, funding source, clearing house and offers technical assistance. Because the CWRM is not a water purveyor, it can lead by example, but otherwise cannot directly implement water efficiency programs. The CWRM depends on water users in Hawaii to participate and implement the measures outlined in this plan.

It is important to note that this Hawaii Water Conservation Plan focuses mainly on "demand side" measures of water use and delivery efficiency measures and programs to implement them. Although other types of "supply side" measures are commonly mentioned when discussing water conservation, such as reuse of recycled water or stormwater capture for groundwater recharge, these practices are not the emphasis of this plan. For the purposes of the Hawaii Water Conservation Plan, water conservation is defined as the reduction in fresh water use by improving the efficiency of water delivery and end water uses.

Principles and Planning Process

The CWRM began this process to develop a water conservation program with three overarching objectives:

1. Develop a coordinated statewide water conservation planning strategy and policy framework.
2. Develop a statewide water conservation program to implement the planning and policy framework.
3. Work collaboratively with water conservation stakeholders to achieve CWRM objectives.

The planning process for developing this water conservation plan involved forming an advisory group, defining a water use baseline, setting water conservation goals and strategies, developing recommended best management practices (BMP), defining and evaluating implementation approaches, and establishing an implementation and funding plan.

Water Conservation Advisory Group

There are numerous categories or sectors of water uses across the State of Hawaii. The uses range from municipal water supply to military to golf course and agriculture. Within the municipal and military sectors, there are also commercial, industrial, institutional, and other uses that are served. Realizing the need for collaboration and cooperation to succeed in a water conservation program, the CWRM sought to establish an advisory group of

stakeholders that would represent such a diverse water use spectrum. The Water Conservation Advisory Group (WCAG) is composed of water industry professionals and experts from across the state with knowledge or interest in water efficiency and conservation. Members represent all major water use sectors in the private industry as well as all levels of government.

During the development of this water conservation plan, the volunteer WCAG met six times over a period of 18 months to help create the statewide water conservation plan and program. During the six facilitated meetings, the WCAG contributed water use data, water conservation program information, participated in the development of sector-based BMPs, and established an initial prioritization of water conservation program elements. The CWRM believes that there should be a continuation of the WCAG or some derivative group of core members to support the implementation of water conservation programs in the state and to provide expert advice during the evolution of the State Water Conservation Program.

Water Use Characterization

The largest water use sectors by volume in Hawaii are the municipal and the agricultural sectors. The municipal (including military) water demand is approximately 205 million gallons per day. Water use data show that the residential sector is the largest municipal water use category, accounting for nearly two-thirds of all municipal water use. After that, the largest municipal water use categories are commercial, institutional, and hotel. Therefore, the categories in which municipal water conservation BMPs should be targeted include residential, commercial, institutional, and hotel use. The data also illustrate that there is a strong seasonal outdoor water use, and that outdoor water conservation BMPs should be considered.

Agricultural use is estimated at well over 350¹ million gallons per day (which represents both the reported and unreported uses), irrigating approximately 50,700 acres statewide. However, water use data are measured at different points within each irrigation system. Most data sets represented metered deliveries from main ditches and pipelines to water use at farm/field level diversion points, so do not represent total water diversions. Almost all of Hawaii's remaining large agricultural irrigation systems are legacy sugar plantation delivery systems. Many of these systems have fallen into disrepair, but some are undergoing rehabilitation through State-funded efforts. Rehabilitation, modernization, and improved maintenance of this system have the potential to improve water delivery efficiency while also improving the reliability of agricultural water supplies. It is important to note that some agricultural operations also have non-irrigation water uses for pest control and to meet regulatory requirements.

There are 104 golf courses in Hawaii with an estimated average water use of 53 million gallons per day in total across the golf course sector. The data indicate that the average 18-hole golf course in Hawaii covers 124 irrigated acres, has a peak month water use of 0.65 million gallons per day, and an average annual water use rate of 0.37 million gallons per day. Based on the data provided by water users and purveyors and on a per unit area basis, the average golf course irrigation water use was about half the average agricultural irrigation water use. However, the range in reported water use for individual agricultural and golf course sector sites was wide enough that a general comparison of water use across these two sectors is not possible.

¹ Agricultural water use based on the best available data at the time of printing which includes surface water and some brackish groundwater. This value does not include water supplied by municipal water utilities. Agriculture irrigation terminology have specific definitions described below:

Agricultural Water Use: Actual surface and ground water (fresh and brackish) used to grow crops and raise livestock. Where agricultural water systems are not available, farmers and ranchers obtain their water from municipal systems and is not included here.

Agricultural Water Demand: Replacement evapotranspiration for fields that are in production utilizing age crop coefficients. During droughts or system problems water use falls short of demand.

Deficit: The difference between agricultural water demand and use.

Water Conservation Measures and Prioritization

During the plan development process, the WCAG formulated a list of BMPs for the municipal, military, agricultural, and golf course sectors. The idea of establishing a landscape water use sector was considered, but since landscape use is common in all these sectors, the WCAG acknowledged the Landscape Industry Council of Hawaii (LICH), Landscape Irrigation Conservation Best Management Practices manual. Practices in the LICH manual can be applied within appropriate sector program elements.

A comprehensive list of sector-based BMPs was developed and the WCAG was led through a prioritization exercise to initially rank the BMPs based on specific criteria. The CWRM and the project team devised implementation approaches for each of the BMPs. These implementation approaches were then prioritized based on the following factors consistent with the CWRM's internal strengths and weaknesses as well as external threats and opportunities: ease of implementation, cost to CWRM, cost to "implementer," and whether the proposed BMP builds upon existing programs. The BMPs/implementation approaches were grouped into sector-based water conservation programs, and recommendations were made for program implementation and scheduling.

Implementation Plan

The Hawaii Water Conservation Plan implementation section describes prioritization, scheduling, and resources needed to implement recommended water conservation programs. There must be a balance of incentives and policy to elicit changes across the water use spectrum. The cost of implementation (both staffing and financial) is a major factor on whether a program can be implemented or not. Benefit-cost analysis is one factor to consider when choosing a project for implementation. Because staff and funding are both limited, implementation of the plan will occur over time and can be advanced as more staff and funding are available. This phased approach to implementation will require wise use of State funds and may necessitate new approaches to working together to implement the BMPs.

The CWRM's approach is to initially provide technical assistance and incentives where possible and to later establish or implement regulations and policies aimed at conserving and protecting our water resources. In this plan, there are a limited number of measures that are policy and/or regulation oriented and require certain actions by permitted water users over time. In most cases, however, the CWRM intends to establish a conservation framework and invite voluntary participation by different user groups for purposes of awareness, demonstration, documentation, or to receive dedicated funding for water conservation. The underlying premise of the plan is to build upon existing water conservation efforts where they exist and ones that have high stakeholder interests and opportunities for cost-sharing, establish partnerships to encourage voluntary participation in CWRM-sponsored water conservation programs, and to foster understanding and support for water efficiency. Any regulatory enforcement should give the affected parties reasonable time to comply without severe economic hardship. Over time, as data collection on water use and water savings evolves, additional programs may become viable and funding may be dedicated to support additional water conservation programs.

The implementation plan describes a 10 year planning horizon. As described in Section 7.1.2, two key implementation programs recommended for the first 2 years are: (1) procedure for conducting and requiring annual water loss audit for municipal, military, and other public water systems, and (2) irrigation metering demonstration projects for agriculture irrigation systems. Providing technical assistance and guidance will help affected stakeholders prepare for and begin to comply with policy and regulatory measures over some reasonable period of time. If funding is available, the CWRM will consider incentives to encourage the use of WaterSense/high efficiency plumbing fixtures and equipment as well as water efficient commercial equipment.

In addition to the recommended water conservation programs, the CWRM will continue to expand its role in coordinating new and existing water conservation programs, improving our water use data collection capacity, exploring policy actions, and pursuing funding opportunities to increase program effectiveness.

Commission Role and Vision

This Hawaii Water Conservation Plan establishes the Water Conservation Program in the CWRM. The CWRM anticipates taking a lead coordination role for water conservation across the State while partnering and collaborating with the WCAG and interested stakeholders. Water conservation programs should complement existing water conservation programs or measures within stakeholder agencies and organizations. Water conservation policies should be developed and enforced giving affected parties reasonable time to comply with rules and regulations. Program success will depend on coordinating water conservation program implementation, sharing resources, and building upon small achievements. The CWRM will pursue a sustainable funding strategy to implement the Hawaii Water Conservation Plan.

Regular water conservation plan updates or sectional revisions are necessary to evaluate program effectiveness, reflect changes happening in the community or in governmental regulations, and other factors such as new technologies. A 5-year update or revision to this plan is recommended.

The term “water conservation” means different things to different people. In Hawaii, a wide range of activities have been associated with the concept of water conservation, from watershed management to protect sensitive recharge areas to over-irrigation to promote aquifer storage and recovery to resource substitution which aims to use non-potable alternatives to preserve natural supplies. For the purposes of the Hawaii Water Conservation Plan, water conservation is defined as the reduction in fresh water use by improving the efficiency of water delivery and end uses.

7.1.3 Other Policy Actions

In addition to the specific BMPs and implementation strategies outlined above, there are other regulatory, policy, and educational actions that warrant consideration by CWRM. These policy actions were not considered in the evaluation and prioritization of the BMPs and implementation approaches, nor were they taken into account when allocating staff time and funding in selecting water conservation actions for implementation. Rather, it was assumed that a portion of the remaining staff availability, or other staff within the CWRM that do not have direct responsibility for the water conservation plan defined herein would take responsibility for the other policy actions.

The policy actions, shown in priority order (high to low), are listed below.

- Continue to expand its role as the coordinating agency for water conservation activities between all levels of government, military, universities and the private sector. (P1)
- Continue development of water use data collection, analysis, and reporting system to enable accurate assessment of water. (P2)
- Explore policy changes to make improvements in water use efficiency and related reporting (e.g., State Water Code, green plumbing codes [IAMPO; ICC], county ordinances, etc) via the State Building Code Council, Hawaii Legislature, and County Councils. (P3)
- Require development and submittal of water conservation plan and annual reporting on implementation of water conservation plan measures as a condition of receiving a water use permit. (P4)
- Explore sources of supplemental funding that can be generated by CWRM to implement the Water Conservation Program. (P5)
- Review Part III of the State Water Code, the Water Resource Protection Plan and Statewide Framework for Updating the Hawaii Water Plan to ensure consistency with the appropriate water conservation policies, regulatory mechanisms and program measures outlined in the Statewide Water Conservation Plan. (P6)
- Establish baseline water use and develop water conservation targets for individual sectors or water systems that can be established in the context of known, available, or anticipated future water resources. (P7)
- Explore policy changes to proactively plan for the expanded use of recycled wastewater and storm-water for agriculture, landscaping, irrigation, recharge, and industrial uses. (P8)
- Establish a water resource management public awareness campaign that incorporates climate change, energy/water nexus, food scarcity, viable agriculture, watershed management, and source protection and augmentation. (P9)

Government should lead by example and CWRM should instill ways to encourage this through outreach, technical assistance, exploring public/private partnerships, explaining the link between energy and water efficiency, recommending amendments to existing legislation, prioritizing water efficiency actions in government agencies and organizations, and researching existing energy and water efficiency performance contracting in government (P10)

7.2 Implementation, Staffing, and Funding

The implementation and funding plan described in this section is generally based on a phased implementation approach: early (1-2 year), mid-term (3-5) and long term (6-10) timeframes. The phased approach was necessary due to CWRM staff limitations and budget constraints. Additionally, phasing the program to build partnerships, provide educational materials, demonstrate and document savings was considered important to building credibility for the program and broadening interest and support. This is especially true when financial incentives and/or regulatory programs are being implemented.