HAWAII'S WATER RESOURCES

DIRECTIONS FOR THE FUTURE

A REPORT TO THE GOVERNOR
OF THE STATE OF HAWAII
by the
STATE WATER COMMISSION

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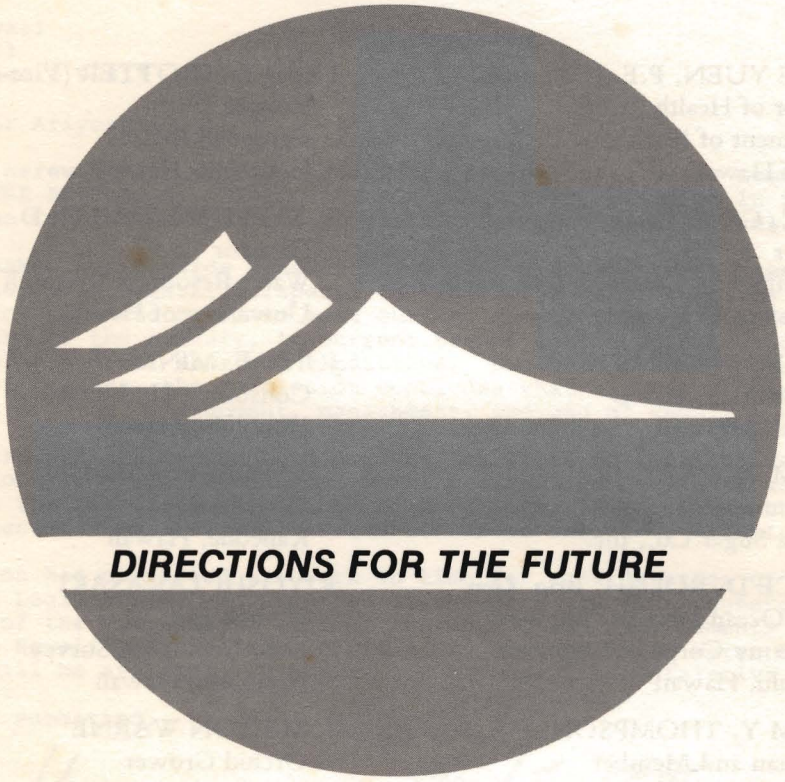

A REPORT TO THE GOVERNOR
OF THE STATE OF HAWAII
by the
STATE WATER COMMISSION

HONOLULU, HAWAII
January 1979

GEORGE R. ARIYOSHI

Governor

THE COMMISSION

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Department of Health
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STATE WATER COMMISSION

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TELEPHONE 548-2312

January 1979

The Honorable George R. Ariyoshi
Governor
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

Dear Governor Ariyoshi:

Transmitted herewith for your consideration is the State Water Commission's report on HAWAII'S WATER RESOURCES: DIRECTIONS FOR THE FUTURE, prepared in response to your charge to the Commission upon its appointment at the State Capitol on October 20, 1977.

The report makes a statewide assessment of Hawaii's water resources from social, economic, and environmental perspectives. Although water supplies are generally adequate throughout the State to meet current needs, there are indications that at about the turn of the century, if current trends continue, Oahu and possibly West Maui may approach water shortage conditions. Because of these potential shortages and for other reasons, the Commission concludes that the State should provide leadership for the optimum development, management, and use of Hawaii's water resources.

Presented herewith are recommended actions for State administrative and legislative implementation. The recommendations chart a direction for State actions to be undertaken within the next five years. By accomplishing these tasks, the State can assure for future generations that ample water resources will be available.

The Commission has completed its work in time for consideration of its recommendations by the Tenth Legislature. Appended to this report are two suggested bills that, in the opinion of the Commission, fulfill the intent and requirements of the 1978 amendments to the Hawaii Constitution, Article XI, Section 7, on Water Resources. The Commission will be available to assist you through the legislative session.

Respectfully submitted,

George Yuen, Chairman

Fred E. Trotter, Vice-Chairman

Doak C. Cox

L. Stephen Lau

Ah Quon McElrath

John F. Mink

William W. Paty, Jr.

Charles F. Reppun

Maurice D. Roush

Kiyoshi Takasaki

William Y. Thompson

J. Milton Warne

FOREWORD

In response to widespread public concern in mid-1977 over the availability of water supplies, Governor Ariyoshi appointed the State Water Commission to review the water situation and recommend appropriate administrative and legislative actions. The Commission selected George Yuen, State Director of Health, as chairman and Fred E. Trotter, a trustee of the Campbell Estate, as vice-chairman, and began its deliberations in October 1977.

The Commission functioned in accordance with the State Administrative Procedures Act and other applicable laws. Operating rules and regulations were promulgated and filed with the Lt. Governor's Office. Regular meetings were held twice a month at 4:00 p.m. in the Board Room of the Department of Land and Natural Resources located in the Kalanimoku Building at 1151 Punchbowl Street, Honolulu, Hawaii.

The Commission's staff, provided by the Department of Land and Natural Resources, consisted of Manabu Tagomori, executive secretary, George Matsumoto, staff planner, Alyce Konishi, secretary, and other personnel from the Division of Water and Land Development.

After reviewing available reports and receiving testimony from major water purveyors statewide, the Commission focused on major problems and issues. It was determined that Oahu and Maui should be given priority in the Commission's deliberations, since these two islands have the most significant potential water problems. Six committees were formed to review specific issues identified by the Commission. The committees and their respective chairperson were: supply, Kiyoshi Takasaki; demand, Ah Quon McElrath; development, J. Milton Warne; management, Charles F. Reppun; rights, Doak C. Cox; and finance, William Y. Thompson.

The committees reported their findings and recommendations in committee reports which formed the basis for the final Commission recommendations. These reports are on file at the Commission office.

The Commission invited representatives of County Boards of Water Supply and other water purveyors to its meetings and provided every opportunity for participation in discussions. The Commission acknowledges the following agencies and persons who ably provided information and reviewed committee reports prepared by the Commission.

Alexander & Baldwin, Inc.: Richard Cox, P.E.; J. Ken Peterson, Esq.

AMFAC: Edward W. Broadbent, P.E.; John Loomis, P.E.

C. Brewer & Co., Ltd.: Harold P. Luscomb

Campbell Estate: Oswald K. Stender

Castle & Cooke, Inc.: George Yim, Esq.

1978 Constitutional Convention: Anthony Chang; Charlene Hoe; William W. Paty, Jr.

Hawaii County Water Commission: Akira Fujimoto, P.E., Jay Sasan

Hawaii Institute of Management and Analysis in Government: Robert Anderson, Ph.D.; Williamson B. C. Chang, J.D.; Jon Van Dyke, J.D.

Honolulu Board of Water Supply: Yoshie Fujinaka, P.E.; Kazu Hayashida, P.E.; Edward Hirata, P.E.

Kauai County Board of Water Supply: Walter Briant, P.E.; Kenneth Taba

Maui County Board of Water Supply: Tatsumi Imada, P.E.; David Nobriga

Maui Land & Pineapple Co., Inc.: Colin C. Cameron

State of Hawaii, Office of the Attorney General: Andrew Lee, Esq.

Theo. H. Davies & Co., Ltd.: E. M. Bush

U.S. Navy: Jim Carl, Lt.; H. H. Haynes, Capt.

Waialua Sugar Co., Inc.: Frederick Gross

Waikoloa Water Company, Boise Cascase Corporation: James Lium

Water Resources Research Center, University of Hawaii: Hiroshi Yamauchi, Ph.D.

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EXECUTIVE SUMMARY

This executive summary distills the essence of the State Water Commission's deliberations into fourteen recommendations. For full consideration of any of the specific recommendations, the appropriate chapter in the report and the committee reports should be consulted. Drafts of two recommended legislative bills are presented as appendices.

BACKGROUND

Widespread public concern in Hawaii over the adequacy of water supplies was precipitated in mid-1977 by a combination of concurrent events:

* A prolonged period of dry weather on all of the islands.
* Recurring droughts on the islands of Hawaii and Maui resulting in crop and livestock losses.
* Ground water levels dropping to all-time lows on Oahu and elsewhere in the state.
* Moratoriums on the development of new subdivisions imposed in some counties because of inadequate developed water supplies.
* Calls for voluntary cutbacks in water use issued by county water departments.
* Promulgation of rules and regulations by state and county agencies for mandatory water use controls under water-shortage and emergency conditions.
* Litigation over water rights.
* Environmental concerns over water development projects raised in public hearings and in the courts.

Acting in response to this widespread public concern, the Governor appointed a panel of water experts, state officials, and citizens to assess the water situation and to recommend appropriate administrative and legislative actions. The panel, convened in October 1977, was named the State Water Commission.

The Commission initially focused on the selection of major water problems and issues for its review. Upon consideration of the Governor's charge to the Commission, reports by government agencies, testimony of water purveyors, and presentations by Commission members having special expertise in Hawaii's water resources, the Commission decided to concentrate on the following major problems and issues: (1) assessing water supply and demand, (2) water for agriculture, (3) water for environmental and social values, (4) regulating water use, (5) water rights, (6) information needs, and (7) financing water programs and projects. Committees on supply, demand, development, management, rights, and finance were formed to review those major problems and issues. The committee findings and recommendations served as the basis for this report.

After a year of work, the Commission has completed its assessment and recommends specific actions to ensure to the extent practicable that Hawaii's water resources will be used reasonably and beneficially in the general public interest and that adequate water supplies will be available for future generations at reasonable costs.

The Commission's recommendations for state administrative and legislative implementation, discussed in the body of this report, are summarized here. The first seven recommendations below have been selected as deserving the highest priority for expeditious implementation. They are arranged generally in the order of immediacy and relative ease of achievement.

PRIORITY RECOMMENDATIONS

1. Stabilizing or Reducing Per Capita Consumption of Municipal Water.

- **Recommendation:** CONTINUE AND INTENSIFY CONSERVATION PROGRAMS UNDERTAKEN BY THE COUNTY WATER DEPARTMENTS AND THE MILITARY TO STABILIZE OR REDUCE PER CAPITA CONSUMPTION OF MUNICIPAL WATER. Action agencies: County water departments and military.

A major factor influencing water demand is a projected increase in per capita consumption of municipal water, from 200 gcd (gallons per capita per day) on Oahu today to 240 gcd in the year 2000. Stabilizing per capita consumption of municipal water at 200 gcd or reducing consumption by conservation measures offers an immediate opportunity to minimize the need to develop new supplies, to reserve available water supplies for future generations, and to save development, operation, and maintenance costs. (See Figure 6.)

Municipal water use in excess of roughly 110 gcd is largely attributable to commercial, industrial, and public uses and to system delivery losses. Aggressive conservation programs by all municipal water users, on Neighbor Islands as well as Oahu, will provide substantial benefits.

2. Regulating Pearl Harbor Ground Water Resources.

- **Recommendation:** CONTROL FURTHER DEVELOPMENT OF GROUND WATER FROM THE PEARL HARBOR BASIN AND TRIBUTARY SOURCES BY APPLICATION OF THE GROUND WATER USE ACT (CHAPTER 177, HRS). AS AN IMMEDIATE INTERIM MEASURE, IMPOSE A MORATORIUM ON INCREASED EXPORT OF WATER FROM THE PEARL HARBOR AREA. Action agency: DLNR.

The combined pumpage of the agricultural, municipal, and military users in the Pearl Harbor area is presently reaching the estimated limit of sustainable yield. Water levels of monitoring wells show a steady decline over a period of 65 years. Although the Pearl Harbor body may currently not be in a critical state, controls are needed over additional developments and increased pumpage to ensure the long-term integrity of Hawaii's most productive fresh water source.

3. Emphasizing Development of New and Alternative Water Sources on Oahu.

- **Recommendation:** TO MEET PROJECTED MUNICIPAL WATER DEMANDS ON OAHU, EMPHASIZE THE DEVELOPMENT OF NEW SURFACE AND GROUND WATER SOURCES AND ALTERNATIVE SOURCES, TOGETHER WITH RESEARCH TO IMPROVE DEVELOPMENT METHODS. Action agency: Honolulu BWS.

Water demand projections for Oahu show a substantial need for new municipal supplies. All other water requirements, except for environmental and social values, show only a token increase. It is estimated that up to 100 mgd may have to be developed over the next 20 years.

Untapped ground and surface water sources are available on Oahu, as shown in Figures 1 and 2. Large ground water supplies are available in the Windward Oahu areas of Kahuku, Kahana, and Koolaupoko. Moderate supplies are available in the Mokuleia, Waianae, and Hawaii Kai areas.

Streams in Windward Oahu, especially Kahana and Punaluu, appear most promising for development of large supplies. Streams in Koolaupoko, mostly perennial, have small flows which can be feasibly developed. Stream developments in the Pearl Harbor area would require large dams to capture flood flows. Such development should be consistent with environmental considerations.

Potential alternative sources include: (1) exchanging low-quality water developed at Pearl Harbor springs and at Waiawa and Waikele streams and treated sewage effluent from Mililani and Honouliuli for high-quality irrigation water; (2) blending brackish water with fresh water; (3) desalting brackish water.

4. Moderating Oahu's Population Growth.

- **Recommendation:** STATE AND COUNTY GOVERNMENTS TAKE INTO ACCOUNT THE FINITE LIMITATIONS OF OAHU'S WATER RESOURCES IN ESTABLISHING POLICIES THAT INFLUENCE THE RATE OF POPULATION INCREASE AND RELATED URBAN DEVELOPMENT. Action agencies: DPED, County planning departments.

Current estimates show that Oahu's total available water supplies that can be developed by conventional means will be fully utilized by the turn of the century, if current trends continue. Practically all of the new water demand, based upon unit consumption of projected population increase, is for potable water. The pattern of urban development, whether concentrated or sprawled, will determine patterns of water distribution.

As previously noted, several alternatives are available to balance water supply and demand on Oahu. Untapped resources are still available for development; wastewater reuse, blending brackish and fresh water, and desalting brackish water are potentially feasible; and technological breakthroughs might enhance available water supplies for future years. Also, conservation of water by all users would help greatly to balance supply and demand.

However, population growth is the primary influence upon water demand on urbanized Oahu. Even though alternative supplies may be developed and conservation measures may be implemented, unless the rate of population growth is decelerated, the water problem on Oahu is expected to persist.

5. Establishing a Permit System for Water Development and Use.

- **Recommendation:** THE STATE LEGISLATURE ADOPT A PERMIT SYSTEM TO CONTROL THE DEVELOPMENT AND USE OF HAWAII'S SURFACE AND GROUND WATER RESOURCES IN ORDER TO PREVENT DEPLETION AND QUALITY DETERIORATION, AND PROVIDE FOR AN INDEPENDENT "WATER USE CONTROL BOARD" TO ADMINISTER THE PROGRAM. Action agency: State Legislature.

The Commission finds that a fundamental measure of public control over water development and use is warranted. Increasing competition for limited water supplies and the shortcomings of court decisions bearing on water use allocation make clear the need for administrative regulation of water use under statutory principles.

A suggested "Water Use Control Act" appended to this report details a comprehensive water use control program. The proposed program, administered by an independent "Water Use Control Board," would regulate the use of surface and ground water by permit on the basis of reasonable and beneficial use in the public interest.

A 1978 amendment of the State Constitution that deals with water resources (Article XI, Section 7) calls upon the Legislature to provide for the regulation of Hawaii's water resources in the public interest. The proposed act is in accord with this amendment.

6. Formulating a State Water Code.

- **Recommendation:** THE LEGISLATURE AUTHORIZE THE FORMULATION OF A COMPREHENSIVE WATER CODE BY A DESIGNATED AGENCY TO DEFINE EXPLICITLY WATER RIGHTS IN HAWAII AND TO DELINEATE THE ROLE OF GOVERNMENT IN WATER MANAGEMENT. Action agency: State Legislature.

Water legislation in Hawaii has evolved over the years in response to specific needs on a piecemeal basis which has often resulted in overlapping administrative powers. Also, the recent "Hanapepe case" has unsettled Hawaii's traditional system of surface water rights. An apparent need has arisen for statutory clarification of surface and ground water rights by the Legislature. The courts then would have a statutory basis upon which to decide water controversies rather than rely entirely on case law.

A Water Code, formulated jointly by appropriate legal, water, political and other disciplines, should define rights to natural waters, overcome significant deficiencies in existing legislation, enunciate a basic water resources policy, and enhance water management efficiency among government agencies.

7. Satisfying Water Information Needs.

- **Recommendation:** ACCELERATE AND IMPROVE PROGRAMS FOR GATHERING AND UTILIZING INFORMATION ON WATER RESOURCES, INCLUDING SUSTAINABLE YIELDS, WATER DEMANDS, WATER CONSERVATION OPPORTUNITIES, METHODS AND COSTS OF WATER DEVELOPMENT, AND ASSESSMENT OF ENVIRONMENTAL IMPACTS OF DEVELOPMENT. Action agency: DLNR.

As demands approach the sustainable yield of water sources currently developed, there is a particular need for a variety of water information to determine precisely the feasibility of demand and supply alternatives. Not only is there a need for more data and analysis, there is also a pressing need to translate such information into terms that are readily understandable and usable by persons who must make water management decisions.

OTHER RECOMMENDATIONS

8. Upgrading Rural Water Service.

- **Recommendation:** UPGRADE MUNICIPAL WATER SERVICES IN RURAL COMMUNITIES TO MINIMUM DELIVERY, QUANTITY, AND QUALITY STANDARDS. Action agencies: County water departments.

The Commission visited some rural communities and found substandard water systems. Most of the rural water systems are modest in size and relatively simple in facility requirements. Upgrading the systems would mainly require replacement of deteriorated pipelines, storage tanks, and diversion structures. The cost of the improvements would be modest compared to major water development projects and would help to preserve rural lifestyles and agricultural production.

9. Supporting Agriculture.

- **Recommendation:** PROVIDE IRRIGATION WATER FOR DIVERSIFIED AGRICULTURE WHEREVER PRACTICABLE, AND ASSURE THE CONTINUING AVAILABILITY OF WATER FOR AGRICULTURE IN GENERAL. Action agency: DLNR.

The Legislature, through the Hawaii State Plan, has adopted a state policy to support agriculture in general and diversified crop and aquaculture production in particular to strengthen Hawaii's economic base. Opportunities to provide irrigation services in support of plantation and diversified agriculture and aquaculture are many. Tolerance to lower quality water and to treated sewage effluent provide a broader range of potential water supplies for agricultural uses than for domestic use. Also, agriculture can realize benefits from improved efficiency of water use.

10. Protecting Water Resources for Instream Values.

- **Recommendation:** ESTABLISH A COMPREHENSIVE STATEWIDE PROGRAM FOR MINIMUM STREAMFLOW CONTROL TO PROVIDE AND PROTECT WATER RESOURCES FOR ECOLOGICAL, AESTHETIC, AND RECREATIONAL USES. Action agency: DLNR.

The usual assessments of current water use and projections of future demands account for traditional uses—municipal, agricultural, industrial, and military—but do not include water for ecological, aesthetic, and recreational purposes. This deficiency is being increasingly recognized in planning, development, data, research, and regulation programs. However, to date there are no specific government or private programs to provide and protect water

resources for ecological, aesthetic, and recreational uses. The need for such programs is apparent.

11. Financing Water Programs and Projects.

- **Recommendation:** UTILIZE THE STATE FUNCTIONAL PLAN ON WATER RESOURCES (WHEN FORMULATED) TO GUIDE STATE FUNDING OF WATER PROGRAMS AND PROJECTS, CONSIDERING STATE COST-SHARING IN AND SUPPORT OF BOND FINANCING FOR COUNTY PROJECTS, COORDINATION OF FEDERAL FUNDING OF STATE AND COUNTY PROGRAMS AND PROJECTS, PROMOTION OF CONSERVATION PROGRAMS, AND SUPPORT OF RESEARCH PROGRAMS BY AGENCIES BENEFITTING FROM THE RESULTS. Action agency: DLNR.

The Hawaii State Plan calls for the development of a water resources functional plan for submittal to the 1980 Legislature for adoption. The functional plan is required to specify priority water programs and projects for state funding to implement the goals and objectives of the Hawaii State Plan and the respective county general plans.

12. Balancing Urban Growth and Water Developments.

- **Recommendation:** BALANCE THE RATE OF URBAN DEVELOPMENT WITH THE RATE OF MUNICIPAL WATER DEVELOPMENT. Action agencies: County planning departments and water departments.

Imposition of moratoriums on subdivision developments by some county water departments has resulted from an imbalance between rapid urban growth and water developments. The moratoriums are intended to allow the water departments to catch up with the permitted urban expansion.

Ample water resources are currently available on all islands for development. With proper long-range planning by municipal, agriculture, industry, and military water agencies and coordination with land use planning, a balance may be achieved between water development and urban growth.

13. Optimizing Water Development on Oahu.

- **Recommendation:** OPTIMIZE ISLANDWIDE WATER DEVELOPMENT ON OAHU, CONSIDERING THE ISLAND'S FULL RANGE OF HYDROLOGIC POTENTIALS AND LIMITATIONS AND REASONABLE COSTS. Action agencies: DLNR, Honolulu BWS.

The development of available surface and ground water sources and alternate supplies has been discussed under the third recommendation above. Another opportunity to obtain additional supplies, more complex and comprehensive, involves optimizing the development and management of the entire island's water resources.

Specific actions include: (a) developing and regulating the export of high-level ground water at Schofield plateau and rehabilitating the storage capacity of dike compartments in the

Koolau Mountains by bulkheading selected tunnels for use as peaking sources to augment Pearl Harbor and Honolulu basal ground water sources during summer months, (b) stabilizing pumpage from wells as much as possible to minimize mixing and the consequent thinning of the fresh ground water body, (c) controlling well spacing and drafts of new wells to increase the sustainable yield of the Pearl Harbor and Honolulu ground water basins, and (d) limiting use of highly saline or low quality water for irrigation in areas where infiltration might degrade the fresh ground water lens.

14. Optimizing Water Development on Maui.

- **Recommendation:** OPTIMIZE ISLANDWIDE WATER DEVELOPMENT ON MAUI, CONSIDERING THE ISLAND'S FULL RANGE OF HYDROLOGIC POTENTIALS AND LIMITATIONS AND REASONABLE COSTS. Action agencies: DLNR, Maui DWS.

Maui has two major underdeveloped water source areas, the northern half of West Maui and the northern third of East Maui. Major urban demand centers are located at Lahaina, Wailuku-Kahului, Kihei-Makena, and Makawao-Pukalani-Kula. The estimated sustainable yield of the Wailuku-Waihee ground water body may be the limiting factor to continued water development for export beyond the Wailuku-Kahului area.

Long-range actions to optimize development of Maui's water resources may include the following: (1) limiting development of ground water in the Wailuku-Waihee area to the basin's sustainable yield and controlling the further export of water, (2) developing additional water supplies in northern East Maui to meet the needs of central Maui, (3) investigating the feasibility of separate systems in the lower Kula area for domestic and irrigation water services, and (4) optimizing the development of the low-head ground water body in the Lahaina district by modifying well spacings and drafts and by extending development into the northern part of the district.

I. WATER SUPPLY AND DEMAND

Water development in Hawaii has been and continues to be carried out piecemeal by various public and private agencies for specific purposes. For example, the county water departments develop potable water and provide water utility service to communities in the state. The sugar and pineapple plantations develop water of varying quality for irrigation, mill use, and some domestic use. Industries develop their own water supplies for processing and cooling purposes. The military develops its own supplies for utility service and national defense purposes. There are also many individual water supply developments by small farmers for taro cultivation and other diversified crops.

This piecemeal approach to water development might pose no serious problems if abundant water supplies continued to be available for all uses. However, only a limited quantity of water of suitable quality is available on each island for development and use. Therefore, optimum development of available water supplies must be achieved at reasonable costs, and considering each island's entire hydrologic potential and limitations.

The Commission assessed available water supplies statewide and determined early in its deliberations that Oahu warranted a more detailed review than any of the other major islands. In the assessment procedure, current uses and forecasted demands were measured against estimated sustainable yields of the various water sources on each of the islands. The following discussion treats Oahu and the Neighbor Islands separately.

THE ISLAND OF OAHU

Background

Water Supply. Mean annual rainfall on Oahu is 660 to 730 billion gallons, equivalent to 1,800 to 2,000 million gallons per day (mgd). However, much of this water is lost to the atmosphere by evapotranspiration and is not available for development. Mean annual stream discharge to the sea is about 157 billion gallons, equivalent to about 430 mgd. Approximately 58 percent of the runoff occurs from November to March; 42 percent, from April to October. Runoff in the seven months from April to October consists largely of ground water discharge into stream channels. Regional distribution of streamflow is shown in Figure 1. Current water use from streams is between 40 and 50 mgd, most of it for sugarcane irrigation in north-central Oahu.

Much of Oahu's ground water occurs in basal reservoirs separated by water bodies, usually at higher levels, impounded by volcanic dikes or other geologic structures. (See Figure 4.) Ground water withdrawal from a basal reservoir does not affect an adjacent reservoir separated by a geologic impoundment. However, water withdrawal from a high level reservoir affects a basal reservoir to which it is tributary.

Estimated sustainable yield of ground water—that is, the water supply that may normally be withdrawn from a source at the maximum rate which will not unduly impair source utility—totals between 480 and 630 mgd on Oahu. Sustainable yield and current average draft in most regions, shown in Figure 2, include both high-level ground water (generally impounded by dikes) and basal ground water (fresh water lenses floating on salt water). The range of uncertainty in sustainable yield of basal ground water is particularly

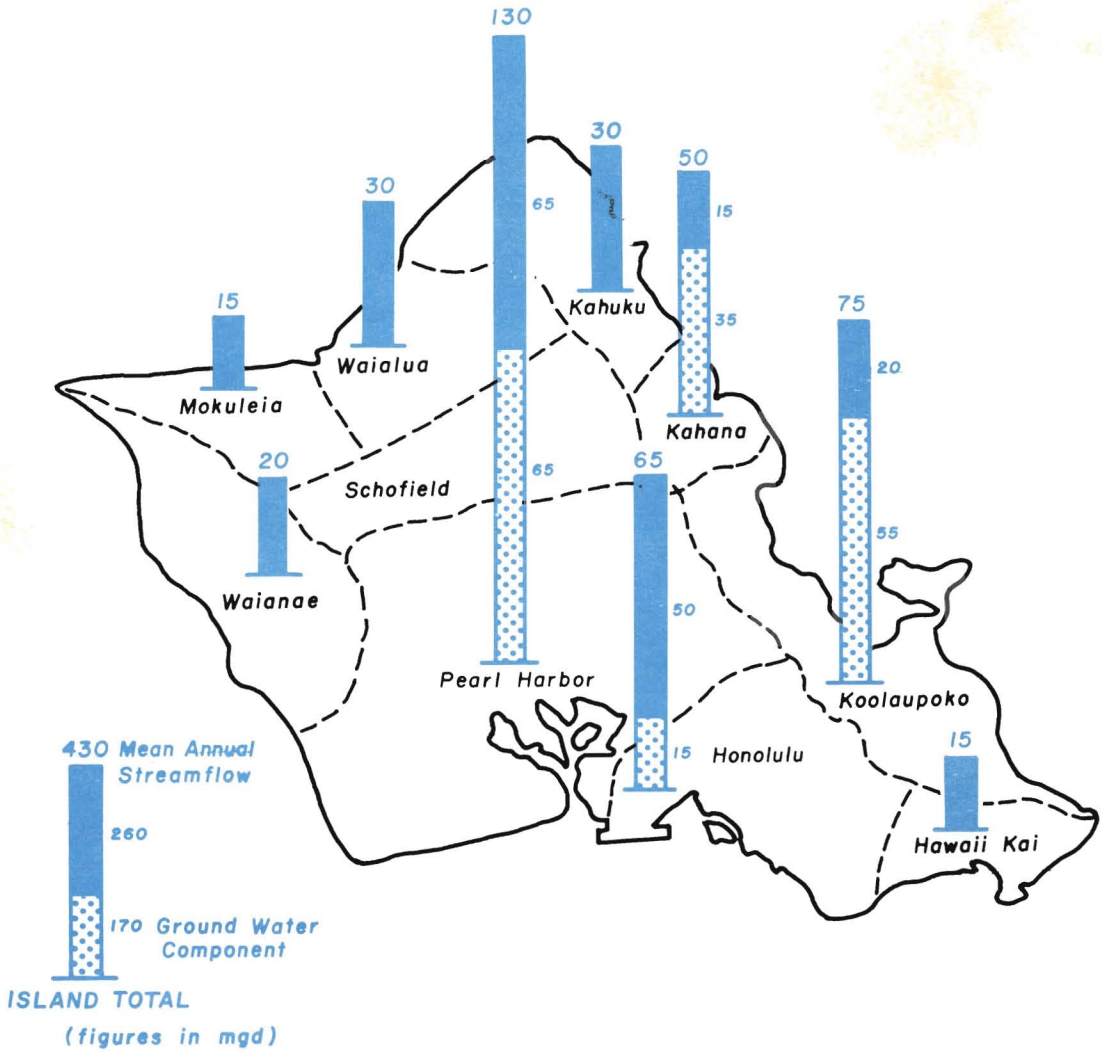


Figure 1. **MEAN ANNUAL STREAM DISCHARGE FROM THE COAST OF OAHU**

large. Islandwide, current ground water draft is less than the estimated sustainable yield. About 60 percent of the ground water draft is of domestic quality, or about 50 percent if the free-flowing Pearl Harbor springs and wells are added to the draft.

The average annual head (height of water surface above sea level) of ground water in the Pearl Harbor area has declined 10 feet since 1910 and the downward trend continues. (See Figure 3.) There has also been a persistent rise in chloride content of the water from many of the wells. These trends indicate that the Pearl Harbor ground water reservoir is approaching the limits of feasible development under prevailing technical and economic constraints. This reservoir is recharged in part by subsurface flow from the high-level reservoir underlying the Schofield plateau, which also contributes to the recharge of the ground water reservoir at Waialua, as indicated in Figure 4. Allowing for the contribution from the Schofield reservoir, the relationship between the range of estimated sustainable yield and current rate of draft of ground water from the Pearl Harbor area is shown in Figure 5.

Water Demand. The rate of water use in the future will depend largely on public policies. Because population level, income

growth, government programs dealing with environmental protection and crop price support, technological development, water pricing policies, and consumer habits and lifestyles all are contributing variables, no one particular forecast of water demand can be considered "best." The projected demand for Oahu in the year 2000, based on projections of population and per capita consumption by the State Department of Planning and Economic Development and the Honolulu Board of Water Supply, respectively, is presented in the table following.

PROJECTED WATER DEMAND FOR OAHU
(Unit: mgd)

WATER USE	1975	2000
MUNICIPAL		
Board of Water Supply	130	220
Others	5	5
INDUSTRIAL (self-supplied)	50	50
AGRICULTURAL		
Sugarcane	240	240
Diversified Corps	5	10
MILITARY (includes municipal use)	40	45
Total	470	570

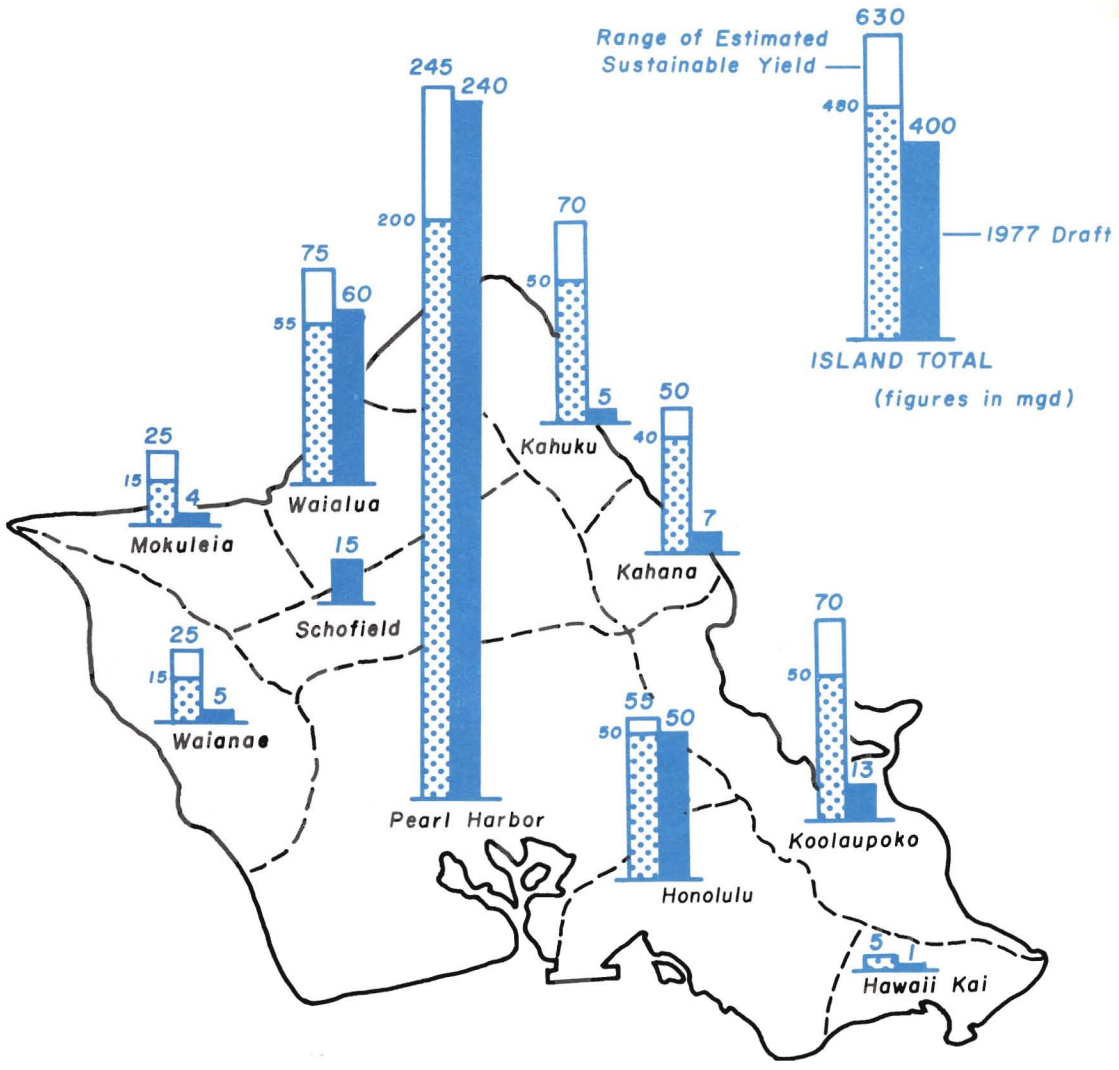


Figure 2. **ESTIMATED SUSTAINABLE YIELD OF GROUND WATER ON OAHU**

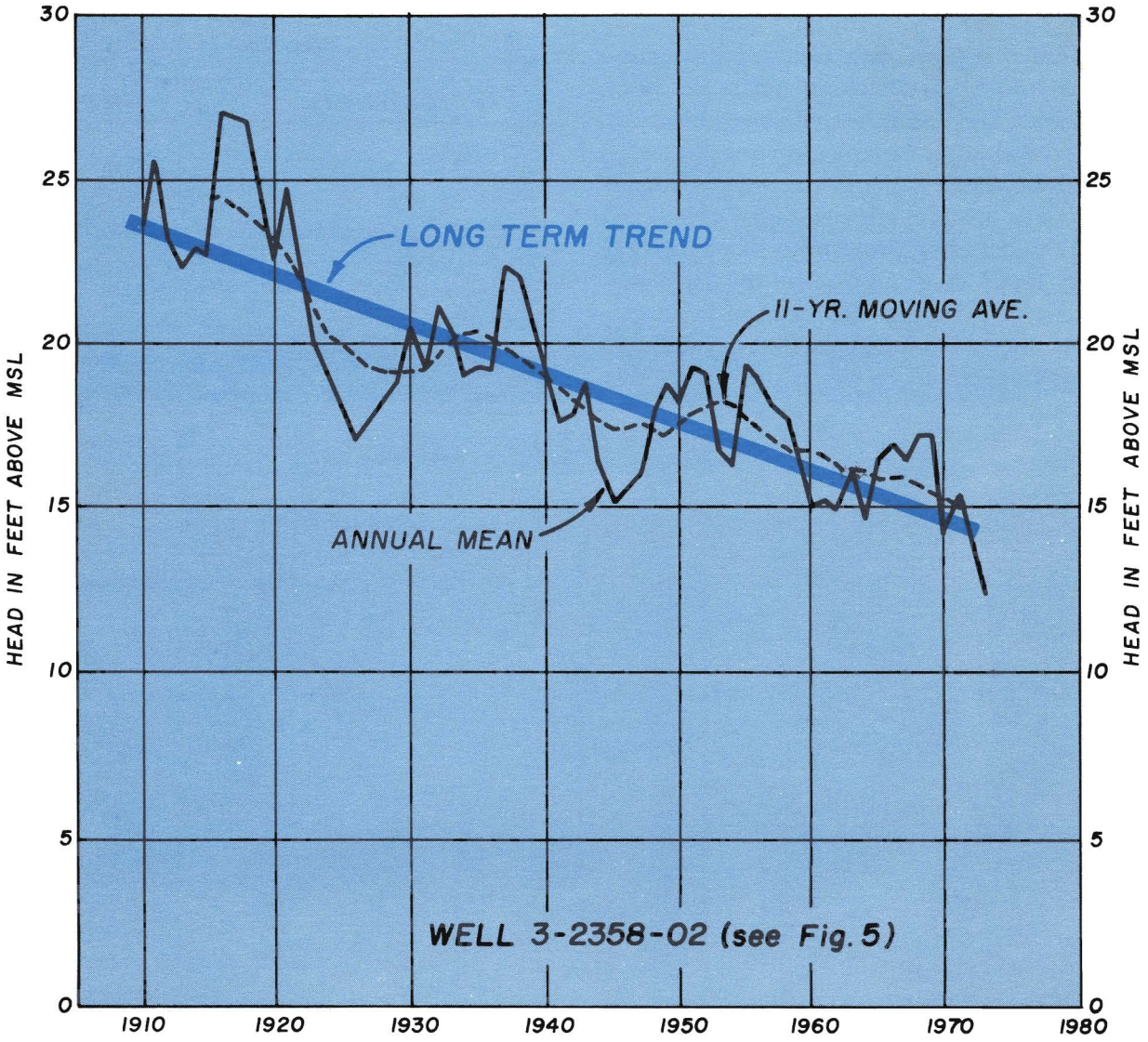


Figure 3. **LONG-TERM HEAD CHANGE OF PEARL HARBOR GROUND WATER BODY**

Widespread ground water developments on Oahu have been independently undertaken by users and purveyors. With improved management practices, the island's available water supplies would be adequate to meet the needs of the near future. However, by the turn of the century, water demand on Oahu might exceed the total sustainable yield of all of the island's water sources developed by conventional methods.

The projected rate of increased demand for municipal water, exceeding that for other uses, is the principal cause for the threatened water shortage. Future water demand for sugar irrigation and self-supplied industry is expected to remain at present levels. Diversified agriculture and military needs are expected to increase only slightly.

The projections of future municipal water demands shown in the above table assume an increasing per capita demand on Oahu from 200 gallons per day in 1975 to 240 gallons per day in the year 2000. Municipal water use in excess of roughly 110 gallons per capita per

day is largely due to commercial, industrial, and public uses and to system delivery losses. In some rural areas, municipal water is also used for irrigation and stock watering.

Potential reduction of about 35 mgd in projected demand on Oahu could be achieved by holding per capita water consumption at 1975 levels. (See Figure 6.) If per capita water consumption could be reduced by 25 percent under 1975 levels, most existing domestic water systems would be adequate with minor additions through the year 2000.

Municipal water supplies are lessened by leaks in distribution systems and defective connections, valves, and fixtures. Programs to detect and correct leaks would conserve available supplies.

Reasonably priced plumbing fixtures are on the market that reduce water use without causing inconvenience to the consumer.

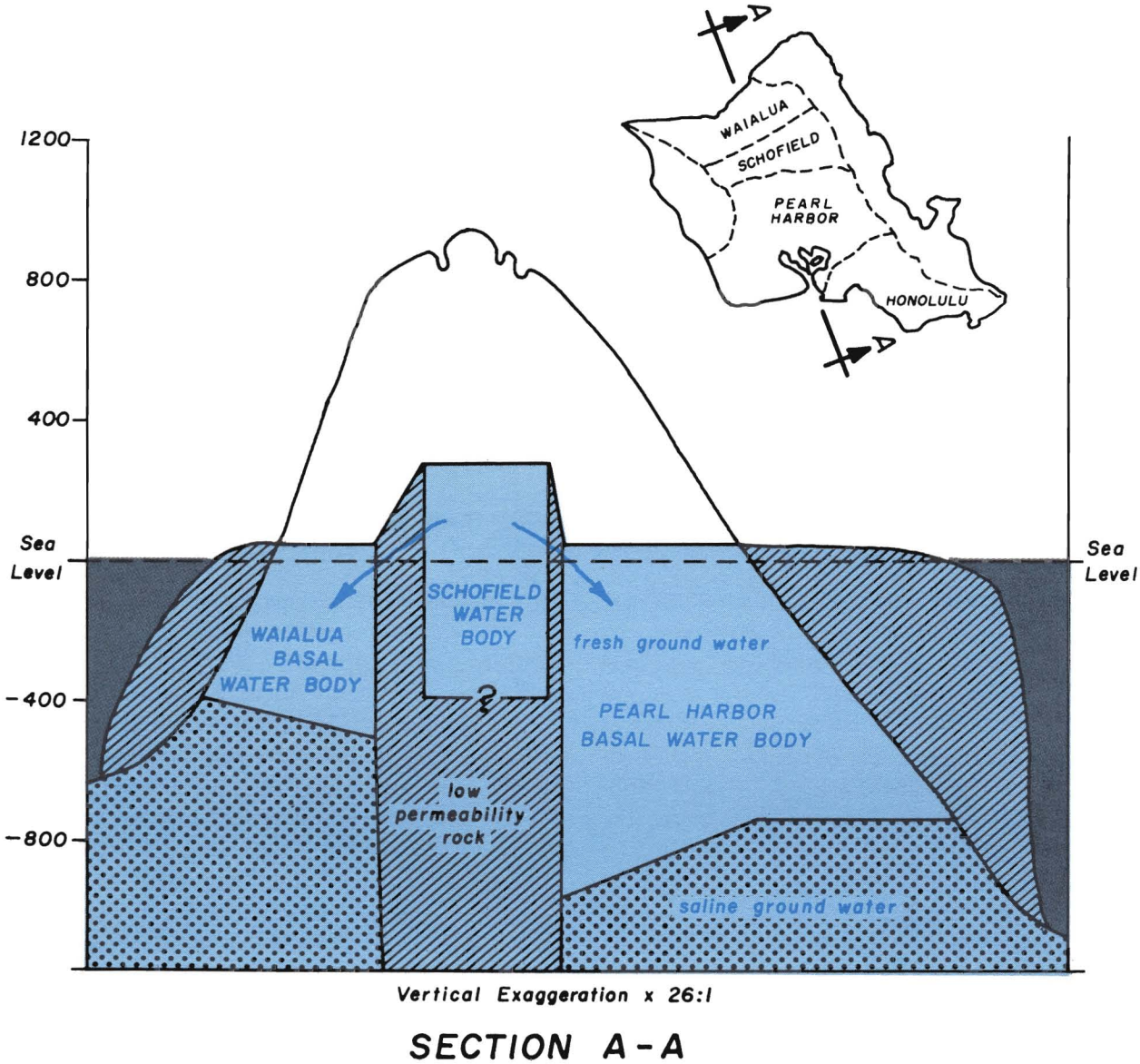


Figure 4. **GROUND WATER OCCURRENCE IN WAIALUA, SCHOFIELD, AND PEARL HARBOR AREAS, OAHU**

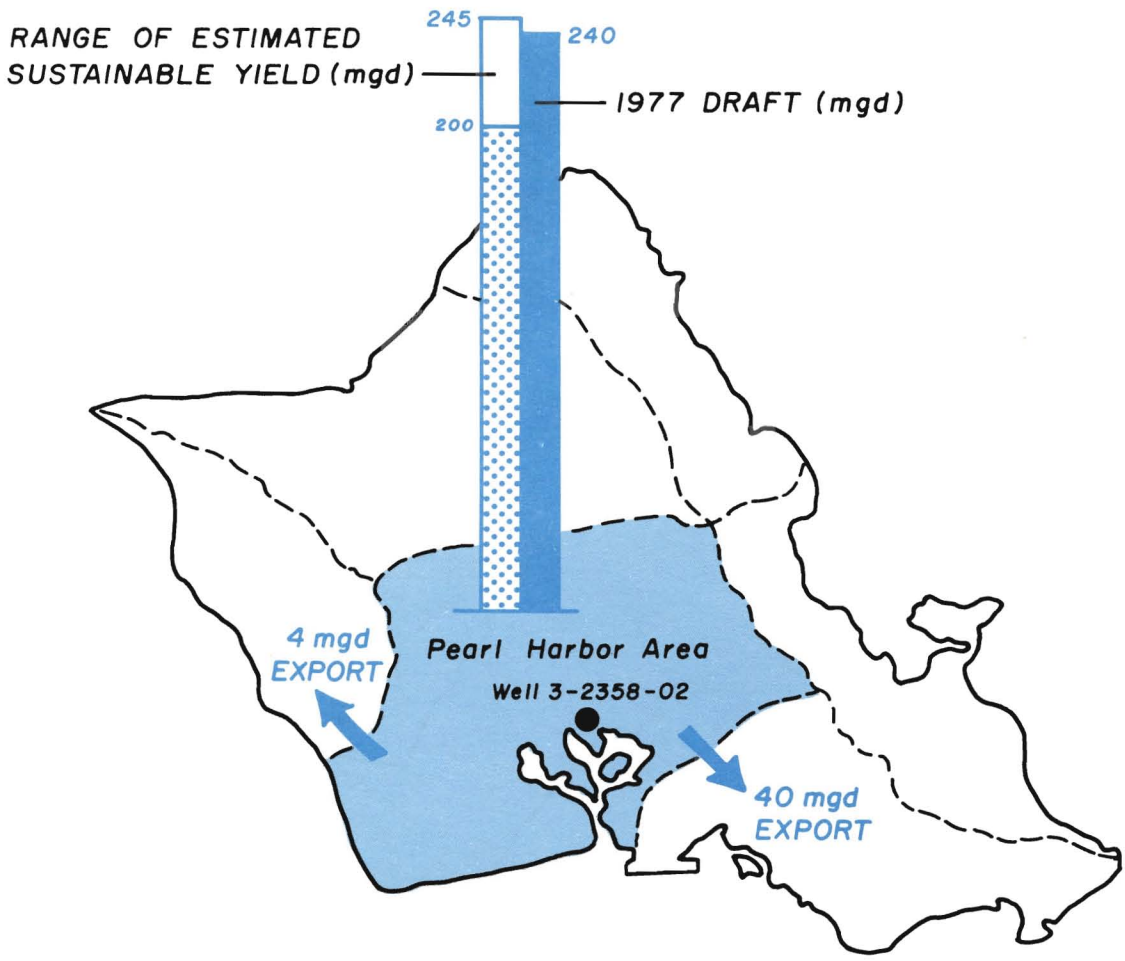


Figure 5. **GROUND WATER DEVELOPMENT OF PEARL HARBOR AREA, OAHU**

Shower, lavatory, and sink fittings have floor regulators and valves to reduce water use. An average shower, which requires 35 to 40 gallons of water, can be reduced by about 50 percent. Toilet fixtures are available which can reduce the amount of water used for each flush from about 8 gallons to less than 4, an important savings inasmuch as toilets account for about 45 percent of all the water used in the average household. Appliances and fixtures now available can reduce total water use in the average household by as much as 35 percent, and savings for commercial establishments can be as high as 50 percent.

By means of an intensive statewide public education program, consumers should be encouraged to conserve water. They should respond once they are aware of resource limitations and the cost of developing and distributing new supplies.

The sustainable yield of ground water could be increased in various ways. For example, the aggregate yield could be increased if the ground water draft were better distributed. Wells have been concentrated in areas such as Pearl Harbor and Honolulu, where water can be easily and inexpensively obtained. As a consequence, ground water available elsewhere on Oahu lies undeveloped or underdeveloped.

Ground water sources in the Kahuku and Kahana areas appear to have the best potential for additional development of large supplies. Moderate supplies could also be developed in Mokuleia. Promising areas for small but sig-

nificant supplies are Waianae, Hawaii Kai, and Koolaupoko. Coastal plain sediments are also a potential source of small quantities of ground water.

Construction of tunnels tapping dike-confined ground water in the Koolau Range has depleted about 26 billion gallons of natural storage. A portion of the depleted storage could be rehabilitated by bulkheading the water development tunnels.

In some mountainous areas where high heads prevail, such as Waianae, the lowering of ground water levels by increased pumping would utilize underground reservoir capacity. Water could be withdrawn during the summer and recharged in the winter, at the same time reducing evapotranspiration and seepage loss.

The sustainable yield of basal ground water reservoirs might be maximized by stabilizing draft. The high-level reservoir beneath the Schofield plateau could be used for storage to meet peak demands that are now met by increased basal water drafts.

Ground water discharge into certain streams on Oahu is sufficiently large to warrant investigating its potential as a water sup-

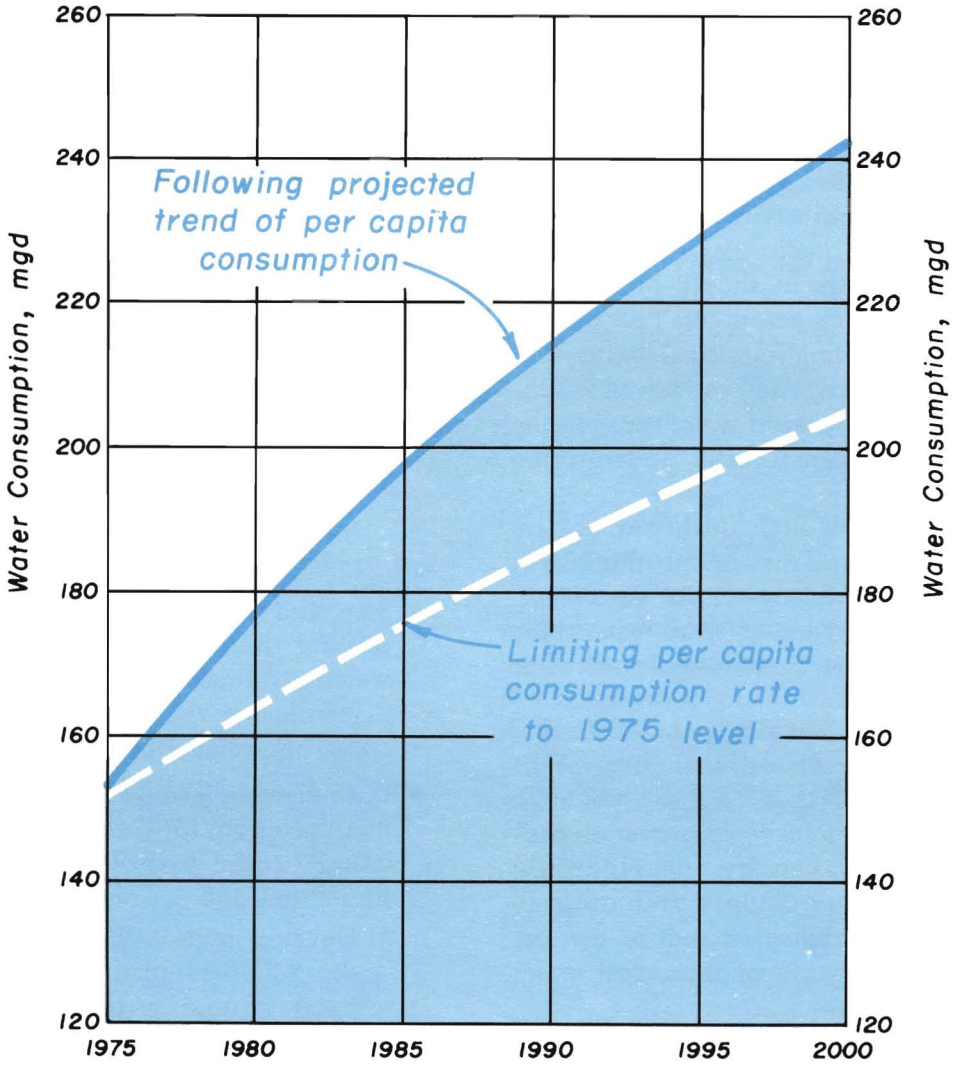


Figure 6. **EFFECT OF CONSERVATION ON MUNICIPAL CONSUMPTION**

ply source. Streamflow from surface runoff now lost to the sea is also sufficiently large to warrant investigating the feasibility of storing or retarding it in order to induce ground water recharge.

Streams on the windward side of the island, especially Kahana and Punaluu in the northern part, appear most promising for development of large supplies. Although streams in the southern part of windward Oahu are small, flows are largely perennial and easily developed. Flows of most streams on the leeward side are small or nonexistent, and development would generally require large dams to retain flood flows. In developing the low-water flows of streams, or ground water supplying these flows, consideration must be given to the ecological and social values discussed in Chapter III.

Caution must be exercised to prevent salinity and other water quality problems that might result from infiltration of excess irrigation water of poor quality.

Wastewater effluent should properly be regarded as a water resource. The proven potential for reclaiming municipal wastewater and reusing it for irrigation in Hawaii is substantial. Properly managed water reuse for irrigation will not contaminate underground water supplies.

Where water of high quality is not required, brackish water may be substituted for, and thus release, fresh water for better use. Also brackish water, and even sea water, may be desalinized where benefits will justify the costs.

Recommendations

- Continue and intensify conservation programs undertaken by the Honolulu Board of Water Supply and military agencies to stabilize or reduce the per capita consumption of municipal water on Oahu.
- Undertake the following specific actions in the Pearl Harbor and Schofield areas, under the provisions of the Ground Water Use Act (Chapter 177, HRS.)
  * Impose a moratorium on the additional export of ground water from the Pearl Harbor area unless and until it can be demonstrated beyond a reasonable doubt that pumpage does not exceed sustainable yield.
  * Control further major development of the Pearl Harbor ground water aquifer.
  * Control additional ground water development and additional pumpage from existing wells in the Pearl Harbor area.
- To meet projected municipal water demands on Oahu, emphasize the development of new surface and ground water sources and alternative sources and aggressively pursue research to determine practical development methods.
  * Develop ground water supplies outside of the heavily drafted Honolulu-Pearl Harbor area, even at higher unit cost.
  * Prudently develop surface water sources by stream diversions and impoundments to the extent that significant ecological and social values are not adversely affected.
  * Substitute reclaimed wastewater for, and thus release, fresh water irrigation supplies for high-quality uses where practicable.
- State and county governments take into account the finite limitations of Oahu's water resources in establishing policies that influence the rate of population increase and related urban development.
- Formulate an islandwide water development program for Oahu, considering the island's entire hydrologic potential and limitations and reasonable costs.
  * Develop high-level ground water at the Schofield plateau to supplement basal ground water sources during peak demands.
  * Bulkhead selected dikes in high-level tunnels in the Koolau Mountains to re-

store reservoir capacities for supplemental supplies to serve peak demands.

* Stabilize pumpage from wells as much as possible to minimize mixing and the consequent thinning of the fresh ground water body.
* Control well spacing, depth, and drafts to optimize the sustainable yield of the Pearl Harbor and Honolulu ground water basins.
* Artificially recharge ground water bodies where practicable.
* Substitute brackish water for fresh water where practicable for low-quality uses.
* Employ dual (potable/nonpotable quality water) systems where feasible.
* Blend brackish water with fresh water to extend supplies where feasible.
* Where practicable and economically feasible, initiate the use of desalinized water.
* Control the use of highly saline or poor quality water for irrigation in areas where infiltration might degrade the quality of ground water suited for domestic use.
* Control the rate of export of ground water from the Schofield area.
* Modify the foregoing actions to the extent warranted, based upon a continuing evaluation of the effectiveness of the controls instituted.
* In light of the above recommendations, reconsider plans for further economic development and urbanization of Oahu regions that are now supplied or might be supplied by water from the Pearl Harbor area.

- Within the context of a growth control policy, allow urban development in consonance with development of available water supplies.
- Continue and intensify programs to conserve Oahu's agricultural water supplies by increasing irrigation efficiency.
  * Improve surface water diversion.
  * Reduce transmission and storage losses.
  * Improve application practices.

THE NEIGHBOR ISLANDS

Background

Oahu is the only major island where full development of all available water supplies is within sight. The available water supplies of the Neighbor Islands, on the other hand, are adequate islandwide to satisfy all domestic demands within the foreseeable future. In some instances, however, they are only marginally adequate for plantation agriculture. Considerably more land could be used for intensive agriculture in dry areas on most of the islands if additional water supplies could be developed at reasonable cost. Locally, both domestic and agricultural demands might in the future exceed the available supplies from easily developed sources. The total resources of each district generally would be sufficient for development, but at increasingly higher costs.

Kauai. Islandwide, Kauai is bountifully endowed with both surface and ground water. There is no foreseeable shortage of water resources to meet future domestic requirements. Agricultural demands will not exceed potential supplies if adequate storage of surface water is provided.

Maui. The fresh water resources of Maui, islandwide, also exceed current and anticipated future needs. Both surface and ground water occur in abundance, but local problems of supply might be difficult to resolve because of costs and allocation considerations.

In the urbanized visitor destination areas of Lahaina and Kihei-Makena, municipal

water demand has already outstripped developed sources. Urban developments in Wailuku-Kahului and Makawao-Pukalani-Kula have also taxed municipal water system capacities. Moratoriums on additional urban developments that depend on county water services have been imposed by the county water department until new water sources are developed and systems improved.

Accelerated water source developments are underway at Lahaina-Napili, Wailuku-Waihee, and in the northern area of East Maui. Considering available supplies in the Wailuku-Waihee area, long-range water developments for export beyond Wailuku-Kahului may need to be stabilized. Additional developments should be undertaken in the water-rich northern area of East Maui and in the northwestern part of West Maui.

Additional water could be developed from low-head aquifers in the Lahaina District, particularly for sugarcane irrigation, by modification of well drafts and spacing.

Molokai. Western Molokai has essentially no water resources suitable for either domestic or agricultural uses. Although a surplus of surface and ground water occurs on the eastern half of the island, much of it is not easily accessible. Domestic requirements and modest agricultural demands in the western half of the island can be satisfied by transporting water from the eastern half, provided that environmental and economic constraints are reasonable.

Hawaii. For the island of Hawaii as a whole, surface and ground water resources are enormous and have hardly been developed. In high rainfall regions, rain catchment is an important source of water supply. Severe supply problems arise in some areas during extended droughts due to the shortage of exploitable sources.

In the Volcano region and the northern part of North Kona, surface and ground water sources cannot be developed or further developed at acceptable costs. The sustainable yield of recently discovered high-level ground water sources now being developed in South Kohala is yet to be determined.

Recommendations

- Upgrade municipal water services in rural communities to minimum delivery, quantity, and quality standards.
- Refine estimates of the sustainable yield of the Wailuku-Waihee ground water source on Maui and other principal surface and ground water sources on each of the Neighbor Islands.
- Formulate an islandwide water development program for Maui, considering the island's entire hydrologic potential and limitations and reasonable costs.
  * Limit development of ground water in the Wailuku-Waihee area to its sustainable yield and allow export only to the extent consistent with the availability of water in the basin.
  * Develop additional water supplies in northern East Maui to meet additional needs of central Maui.
  * Investigate the feasibility of separate systems in the lower Kula area for domestic and irrigation water service.
  * Optimize development of the low-head aquifer in the Lahaina District for additional irrigation water supplies by modifying well drafts and spacings.
  * Develop ground water north of plantation fields on the western slope of West Maui to meet additional needs in the Lahaina-Napili area.
- Determine more precisely the adequacy of recharge to the recently discovered high-level ground water sources in South Kohala to sustain the yield required for development.

II. WATER FOR AGRICULTURE

Background

A critical statewide issue has emerged during the past decade as urban growth has encroached upon established agricultural activities. The issue generally embraces competition for land, economic diversity, open space, and, more recently, competition for water.

Irrigation for sugar production is the dominant water use in Hawaii, presently consuming about 51 percent of Oahu's developed water supply. In contrast, water use for diversified agriculture is relatively minor, only about 1 percent on Oahu. Diversified agriculture generally is more concerned with the cost of water than with availability of supplies. However, certain farm locations lack feasible water supplies.

Diversified agriculture is supported by state legislative and administrative policy. Legislative policy is expressed in the Agricultural Park Law (Chapter 171-111, HRS) and the Hawaii State Planning Act (Chapter 226, HRS).

Past state involvement in agricultural water supply has been confined to the development and operation of water systems serving specially formed irrigation districts. Except for those served by state irrigation systems, diversified farmers must either rely on their own water systems or, usually, upon municipal water systems operated by the respective county departments of water supply. The counties furnish irrigation water for diversified agriculture as an accessory, nonmandated service at rates only slightly lower than domestic rates. Furthermore, present county policies require that the landowner bear the costs of upgrading the service facilities to meet utility standards.

Substantial quantities of agricultural water can be saved by improving application methods. In water-short areas, furrow and ridge irrigation should be phased out and more efficient sprinkler or drip irrigation methods employed.

Using nonpotable water could expand potential supplies for agricultural purposes and at the same time reserve potable supplies for domestic use. Surface water, usually the cheapest to develop, has traditionally been used for irrigation. Such water, less suited for municipal purposes because of the need for purification, should be put to beneficial use for diversified agriculture where practicable and not harmful to other uses. Effluent from sewage treatment plants may be a suitable alternative supply for certain areas and farm applications.

In areas where urban water demands are increasing and total demands are approaching the aggregate sustainable yield of available sources, competition for the water supplies is likely to create a problem for irrigated agriculture. The problem is most likely to arise where agriculture is dependent on basal ground water sources.

Even if the continued availability of irrigation water supplies is protected by water rights, the increased draft from ground water bodies may require more expensive technology than the agricultural industry can afford to assure a continuous supply of water low enough in salinity for irrigation purposes.

The problem is similar to that regarding the availability of land suitable for agriculture. The land problem is met by delineating agricultural districts under the Land Use Act and appraising the value for tax purposes in accordance with agricultural economics and soil characteristics.

Unless economics and water quality are considered in allocating water supplies for agricultural use, just as economics and soil qual-

ity are considered in allocating land for such use, future decline in agricultural production may be expected in areas where competition for water supplies becomes increasingly critical.

Recommendations

- Locate agricultural parks where water is available, and develop irrigation water to supply them.
- Where practicable, promote the development of agricultural water systems separate from domestic water systems.
- Use nonpotable water for agriculture where potable water is in short supply.
- Actively encourage wastewater reuse for irrigation; site new sewage treatment plants accordingly.
- In those locations where the municipal system is the only alternative available for diversified crop irrigation, accommodate those farmers who are willing to pay the prevailing rates and comply with applicable rules.
- Continue special agricultural water rates at reasonable levels, subject to periodic review.
- Provide state grants to county water departments to subsidize the service of irrigation water for diversified agriculture.
- Consider the possibility of allocating water supplies for agricultural use based upon economic and water quality considerations, just as economics and soil quality are considered in delineating land districts for agricultural use.

III. WATER FOR INSTREAM VALUES

Background

Hawaii laws do not specifically provide for the protection or preservation of water for instream values.

The Coastal Zone Management Act (Chapter 205A, HRS) establishes a policy to "Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs." However, this policy has not yet been implemented.

Under the Environmental Policy Act (Chapter 344, HRS), it is state policy to protect recreational and aesthetic values, water quality, and conditions favorable to the continuing propagation of fish and wildlife, including endangered species.

Chapter 343, HRS, "Environmental Quality Commission and Environmental Impact Statements," provides that environmental concerns be appropriately considered in water project implementation. While this statute engenders environmental sensitivity and fosters an appropriate balancing of economic and environmental values, it does not establish any legal rights in the public for the use of water in natural stream courses.

To determine what minimum streamflows should be maintained, information is needed on the distribution of fish and other organisms living in or migrating through the lower courses of the streams. The flows required to maintain the stream ecosystems, including the populations of these organisms, must also be determined. Recreational and aesthetic stream sites must be inventoried. The values of diverted streamflows must be balanced against the values of flows left undiverted for the maintenance of ecological, recreational, and aesthetic qualities.

Neither the absolute minimum flows appropriate to maintain such ecological, recreational, and aesthetic qualities nor the ratios of such flows to natural flows will be the same for all streams, but should be determined case by case.

Maintenance of those minimum streamflows that are in the public interest should be provided for in the functional plan for water resources development that is to be formulated under the State General Plan. That plan should be compatible with the Coastal Zone Management Act and the Environmental Policy Act, as well as other functional plans. If a permit system for water development and use should be adopted, the award of permits for stream diversions should take into account the public interest in maintaining minimum undiverted flows.

In the meantime, protection should be afforded to those ecosystems that would be irreversibly altered if additional diversions were to reduce streamflow.

Recommendations

- Establish a comprehensive statewide program for minimum streamflow control to provide and protect water resources for ecological, aesthetic, and recreational uses, giving consideration to economic values.
- In water and related land resources planning, recognize and protect the environmental values of water for recreation, aesthetic appreciation, water quality control, fish and wildlife propagation, and other instream uses.
- If a permit system to regulate water development and use is established, direct that the environmental values of water undiverted as well as diverted from streams be considered when acting upon permit applications, and also consider granting permits to protect minimum streamflow in the public interest.
- In the interim, provide whatever protection is possible under present laws against irreversible changes in stream ecology.
- As environmental values are recognized and protected in reservoirs and streams, facilitate public benefits from their use where appropriate through government acquisition of property rights.
- Make a concerted effort to assure that necessary environmental data are collected, published, analyzed, and used in making decisions concerning water development.

IV. REGULATING WATER USE

Introduction

Historically, there has been little need in Hawaii for comprehensive water use regulation. Islandwide, rainfall is abundant and water supplies are plentiful on most islands. Water resource limitations in dry areas have generally been taken into account in development, and there are few areas in which there has been serious competition among users for limited supplies. There is no overall administrative procedure to control surface water use. The recent controversial proposal of the state Department of Health to regulate minimum streamflow for environmental and water quality purposes is perhaps the first attempt by the state to control surface water use.

Also, Hawaii does not regulate or administer ground water withdrawals except when there is a declared threat to a particular ground water area. Under such circumstances, the critical area would be regulated pursuant to the Ground Water Use Act. To date, the state has not exercised such regulatory powers. However, the statutes require that information be filed on well drillings, mandate that wells be operated to prevent wastage, and prohibit pollution of aquifers.

Some measure of control over ground water withdrawals is provided on Oahu where permits to drill and operate wells are issued by the Honolulu Board of Water Supply. A recent amendment to the board's rules and regulations places all wells on Oahu under BWS control during specified water-short periods. Primary emphasis of the BWS regulation is upon water conserva tion; mandatory restrictions would be imposed only when condi tions severely deteriorate.

Other water users and purveyors on Oahu have also developed their own programs for water conservation, which are voluntarily instituted. There are similar voluntary ground water controls on Hawaii, Maui, and Kauai.

The Commission finds that an additional measure of public control over water development and use is warranted. Increasing competition for limited water supplies and the shortcomings of court decisions bearing on water use allocation make clear the need for administrative regulation of water use under statutory principles.

Alternative Arrangements

A brief review of alternative institutional arrangements for regulating water use, particularly those used in Mainland states, is helpful in determining a suitable arrangement for Hawaii. The following arrangements have been considered by the Commission.

Western States System. In the western states, rights to water use are based on the "appropriation" doctrine. Water resources administration is concerned with appropriation, distribution, and adjudication. Typically, a single administrator, sometimes supervised by a board or commission, (a) keeps records of water use; (b) receives, reviews, and approves or disapproves applications for new uses; (c) appoints water masters to supervise water distribution in accordance with recorded water rights; and (d) initiates quasi-judicial administrative proceedings to settle disputes.

By requiring that an application be filed with a central agency and a preliminary determination of whether water is available for the use intended, state controls assure that water sources are not overutilized. It is apparent that in this administrative process, as with those alternatives discussed below, statutory guidelines and criteria are of utmost importance in determining how and for what uses water rights are acquired.

Eastern States System. Regulatory procedures under the traditional riparian rights system followed by eastern states are not as comprehensive as those in the western states, because water is more plentiful and its allocation is difficult to quantify.

The permit system, which many eastern states have adopted to control water use, is exemplified by the Florida Water Resources Act of 1972. The Act preserves and protects preexisting riparian rights that are actually being used, but requires that future riparian uses be initiated only after acquiring a permit from a state regulatory agency, and allows nonriparian uses through the issuance of permits.

Certain eastern states, notably New York, exercise considerable control over water allocation and use without directly regulating water rights. This is because a number of water supply entities exercise control over water allocation, distribution, and use within their service areas. These water supply entities, in turn, are subject to legislative and administrative controls over water use. Thus, while these entities are not required to obtain permits in order to divert water from streams, they are subject to state controls in the allocation and use of such water. They are also subject to state supervision in planning water supply projects, and they are guided by a statewide water use plan.

The above type of administrative control might be suitable for Hawaii because of the present water management relationship between the state and counties and the requirement of the State General Plan for a statewide water resources functional plan.

Expanded Ground Water Use Act. Hawaii's Ground Water Use Act might be expanded to cover all ground water areas, whether designated as threatened by the Land Board or not, and to include surface water as well. The Act already provides the mechanism for regulation by a permit system and for hearing objections to decisions of the Land Board.

Special Management Districts. Special districts to manage particular basins might be formed, either by action of the State Legislature or by voluntary action of various government and private water users.

State-County Cooperative Arrangement. Hawaii might adopt a regulatory arrangement whereby the state and counties cooperatively manage water resources, with due consideration given to public participation in decisions.

Advantages of State Regulation

State regulation of water development and use in Hawaii is believed to be appropriate for these reasons:

1. Precedents established in other states over many years of satisfactory administration. Experience gained by these states may be used to advantage in conducting Hawaii's regulatory program.
2. Compatibility with state land use administration. Land use districting decisions by the Land Use Commission should be influenced by water availability; similarly, water use decisions should parallel land use opportunities. Water use administration by the state would facilitate consistency in decisions involving both land and water resources.
3. Broad state perspectives concerning all major water uses including domestic, agricultural, industrial, and environmental. These various water uses should be regulated in accordance with state general policies and goals.
4. Statewide application of water use regulations.
5. Compatibility and consistency with amendments to the State Constitution adopted in 1978, particularly the new section on "Water Resources" (Article XI, Section 7).
6. Compatibility and consistency with state policies expressed by the Legislature in the Hawaii State Planning Act of 1978. The Act calls for unifying all long-range programs in Hawaii by requiring county general plans and development plans to conform with the

Hawaii State Plan. It also provides that a state functional plan for water resources be formulated on the basis of county general plans, so that water development, regulation, research, and data programs may be coordinated and priorities set for state, county, and federal financing.

Possibility of Water Use Regulation by Land Use Commission

Because of the close interrelationship of water use and land use, there is merit in empowering the Land Use Commission to oversee the use of water resources throughout the state. Yet, the assignment of water use regulation to an agency that already exercises broad control over land use may overburden that agency or introduce unforeseen complications.

Inasmuch as comprehensive regulation of water resources use will be a new experience for the state, it appears desirable at the outset to assign administrative control to a single-purpose agency, leaving the matter of conjunctive regulation of water and land use to a later period when sufficient experience has been gained and evaluated.

Desirability of Independent Agency

To minimize the likelihood of bias or undue influence in the decisions of the regulating body, the following requirements are desirable:

1. The body be independent of any existing agency having water development responsibilities.

2. Its operating budget be submitted to the Legislature through the Governor independently of any existing agency.

3. A permanent staff be provided to accomplish the regulatory functions.

Composition of the Regulatory Body

Several alternatives for composition of the regulatory body suggest themselves, such as full-time members, part-time agency heads or citizens, or any combination. Also, the number of members is subject to debate. Possible background of the membership ranges from citizens with no specialized knowledge of water to major water users, as well as any combination.

The Commission favors a board of nine part-time members from the general public, appointed by the Governor and subject to Senate confirmation. Each county would be represented by one member nominated by the mayor. None of the members should be water developers or employees or agents of water developers. The chairman would be designated by the Governor. A permanent staff would be headed by an executive officer with technical competance in water resources.

Regulatory Functions

The Commission believes that water resources development and use in Hawaii would best be regulated under a registration, certification, and permit system. Under this system, the regulatory body would be given the authority by statute to carry out the following functions:

1. Register and certify existing water development and use and grant permits for new water development and use.

2. Keep records of water use rights and water development and use necessary for board actions.

In addition to the two functions outlined above, water shortage or emergency regulation under the Ground Water Use Act should be transferred to the new regulatory body. Honolulu Board of Water Supply regulations requiring well drilling permits, as well as regulations on ground water control during water shortages, should also be transferred. This would eliminate any state-county conflict over regulation of the same water resource.

The functions of the proposed independent state body would be confined to *regulation* of the development and use of Hawaii's water resources. Other water resource

functions, such as development, planning, research, and data collection, undertaken by existing agencies should not change. Functional relationships among agencies concerned should be coordinated by or in accordance with the state water resources functional plan to be formulated by the Department of Land and Natural Resources under legislative mandate.

Water Allocation Principles

The promulgation of rules for allocating available water supplies during both normal and "threatened" times would define in advance the principles to be applied, improve stability in investments, minimize reliance on the courts to administer water allocation, and provide a firmer basis for water management decisions.

Allocating Supplies During Normal Times. The allocation of water during normal periods of sufficient supplies can be done either administratively or through the free market process. Administrative allocation involves no sale, for only permission to develop and use water is granted. Many of the Mainland states initially allocate water administratively; transfer is either by administrative reallocation or via the free market.

Typically in Mainland states, water allocation is based upon beneficial use and public interest, although standards defining the criteria are often lacking. While allocation decisions must be made on an individual basis, the Legislature should define elements of public interest to be evaluated in making the decisions.

Guidelines for allocating water during normal times should include the following points:

1. In determining the public interest, the state functional plan on water resources should serve as the guiding document to control, protect, develop, and conserve Hawaii's water resources.

2. Where export of water from the area of its origin is contemplated, alternative sources of supply within the destination area should be considered, particularly if projected water demands in the area of origin will ultimately require available supplies.

3. Water in its natural courses identified for ecological and social values should be adequately protected in the allocation process.

4. Provisions should be made to reserve water for specified future uses consistent with the state functional plan on water resources.

5. It should be determined whether it is in the public interest to allocate water for a limited period of time, subject to reversion to the regulatory body for reallocation.

6. Economic and environmental impact statements should be submitted to evaluate the merits of any significant proposed use.

7. Water use applications should be evaluated in administrative hearings with specific findings by the regulatory body on each criterion considered. (Such findings would be utilized for any judicial review.)

8. Water allocation procedures must take into account the satisfaction, protection, and accommodation of existing rights. A public record system to identify and record these rights is necessary.

9. Water should be reallocated when its use is no longer reasonable and beneficial under changing conditions.

Allocating Supplies During Threatened Times. The Ground Water Use Act adequately serves to allocate ground water supplies during periods when particular ground water bodies are endangered and the state designates such bodies for regulation. The Act recognizes three degrees of endangerment to ground water supplies: (1) perceived threat in the basin, but no water shortage; (2) water shortage in the basin; and (3) emergency affecting public health, safety, and welfare.

The Act provides guidelines governing the allocation of the supply among uses in general and allows the Board of Land and Natural Resources to promulgate implementing rules and regulations. Essentially, the Act

gives preference to domestic use and other existing uses considered beneficial and specifies that regulation be effected by apportioning, limiting, rotating, or prohibiting water uses.

However, since the Ground Water Use Act does not regulate the allocation of surface water, its effectiveness during times of shortage might be limited. While an emergency allocation scheme for surface supplies may have the advantage of flexibility, it has the disadvantages of being created in a time of crisis and of causing uncertainty for all water users. Hence, state regulatory authority over surface water complementary to its powers over ground water during threatened times should be legislated and standing rules of allocation promulgated.

Principles for a Regulatory System

The Commission believes the following principles to be sound guides for the formulation of a statute to regulate the development and use of water:

1. All development and use of water supplies existing at the effective date of the statute should be allowed to continue, but as registered and certified, and only if the existing use is reasonable and beneficial. Certificates should be unlimited in time and, except for those certifying appurtenant rights, should be revocable after a period of non-use.

2. Permits should be required for all development and beneficial use of water supplies initiated after the enactment of the statute; should be limited in time; should be revocable after a specified period of non-use; and renewals should be subject to review and approval.

3. A permit should only be granted if water is available and the proposed use: (a) is a reasonable and beneficial use; (b) will not interfere with any existing legal use of water; (c) will not impair established instream values (e.g., minimum streamflow); and (d) will not degrade water quality.

4. All registration and certification of water use rights in the state and all permits granted should appear on public records and should be transferable.

5. Substantial changes in water development facilities, the quantity or rate of diversion or withdrawal, and the nature, time, or place of water use should require the approval of the regulatory agency.

6. There should be no restrictions on the location where water may be used. However, in cases where conflicting contemplated uses are equally beneficial, lands closest to the water source should be given priority.

7. Environmental impact statements should be required for diversions, withdrawals, and uses having a significant impact on the environment.

8. Consumption of water supplies by individual users obtained from water developers (e.g., county and plantation water systems) should not normally be subject to regulation.

9. Rules for allocating water in periods of shortage should be incorporated into the regulatory system, with provisions: (a) that would make all uses permitted after enactment of the statute subordinate to registered and certified uses initiated before the statute; and (b) that would distribute water to post-statute users in accordance with the date of application.

Water Use Control Act

The Commission proposes a "Water Use Control Act" (Appendix A) liberally adapted from the Model Water Use Act formulated by the National Conference of Commissioners on Uniform State Laws, taking into account the peculiarities of Hawaii's hydrology and the history of water development in Hawaii. The proposed Act embraces the following principles:

1. Constitutional rights must be recognized and protected.

2. Water resources must be utilized most beneficially, consistent with practical considerations.

3. Availability of a relatively dependable supply of water must be sought to safeguard

the economic and social investments of private and public users.

4. Administrative procedures adopted for the regulation of water use must be practicable and directed to serving community needs.

The proposed Act is intended to provide for a practicable system of water regulation consistent with established principles of law and equity. It provides for an independent Water Use Control Board patterned after the organizational arrangement discussed above to regulate all water development and use in Hawaii in accordance with suggested principles and procedures.

Other functions such as planning, development, protection, research, and data collection would remain with existing agencies such as the Department of Land and Natural Resources, Department of Health, Water Resources Research Center, and respective county Departments of Water Supply.

Although water quality regulation is an integral part of any comprehensive water use control program, it is suggested that this function remain with the Department of Health. At a later date, if appropriate, the water quality program might be administered by the Water Use Control Board.

Recommendation

- Establish a state agency, independent of agencies with water development responsibilities, patterned after the organizational arrangement discussed above, to regulate all water development and use in Hawaii in accordance with suggested principles and procedures. (A suggested "Water Use Control Act" is provided in draft form as Appendix A.)

V. WATER RIGHTS

Background

The owner of a private water right is protected against competitive uses by other private parties except through prescription in accordance with law. The state, however, has the power to condemn private water rights and even has regulatory power over water uses subject to private rights. In cases involving conflicts between public and private interests, the definition of water rights is significant in determining to what extent private parties must be compensated for restriction on private water use resulting from diversion of water for public use or from government regulation of water diversion, transport, storage, or use.

To date, the applicability of various water rights doctrines in Hawaii has been determined entirely by the courts. Two alternative systems may be distinguished: one representing the cumulative effects of many court decisions during the period from the Great Mahele to 1973, the other being the opinion rendered in 1973 by the Hawaii Supreme Court in what is referred to as the "Hanapepe case" *(McBryde* vs. *Robinson).*

The Hanapepe case was initiated in a lower state court to settle disputed private rights to water in Hanapepe Valley on Kauai. Acting as water commissioner, the lower court rendered its decision in accordance with the prevailing case law on water rights. On appeal, the Hawaii Supreme Court ruled in 1973 that certain of the rights in the earlier decisions were inapplicable in Hawaii and that the extent of other rights was more limited than had been held in earlier cases.

In 1978 (in *Robinson* vs. *Ariyoshi*), the U. S. District Court enjoined the state from taking administrative action in reliance upon the Hanapepe case, on the ground that the Hawaii Supreme Court had erred both procedurally and substantively. The state has since appealed this decision to the Ninth Circuit Court of Appeals.

A major issue in the wake of the Hanapepe case is whether state restriction of private diversions and use, authorized under prior case law, would be unconstitutional taking of private property if not compensated. Because of the constitutional nature of this issue, and because of the judicial origin of the alternative systems of water rights, this issue might ultimately be settled upon completion of the appellate process.

However, neither of the water rights systems enunciated by the courts is ideal from the standpoint of public welfare. A preferable system of statutory water rights could be enacted by the Legislature. Such a system could not only help to resolve the present water rights controversy in the courts, but also result in a more comprehensive water rights system. A statutory system of water rights should:

1. Recognize the sovereignty of the state with respect to regulatory power over all water resources in Hawaii, except where in conflict with federal law.

2. Provide a sound basis for government regulation and control of water development and use so as to assure water supplies of appropriate quantity and quality from ground water aquifers and both diverted from and free flowing in surface water streams.

3. Adequately safeguard both private and public investments in, and dependence on, water developments for reasonable and beneficial uses.

4. Provide, as appropriate, for additional public and private water development for reasonable and beneficial use within the limits of sustainable yield.

5. Provide the bases for appropriate trans-

fers of water rights and for appropriate transportation of water.

6. Duly consider hydrologic principles and ecological and social values.

Such a statutory system of water rights might be incorporated in a comprehensive water code not only setting forth desired principles governing respective private and public rights but also providing for the regulation of water use and delineating the administrative framework for all water functions. Such a code would serve as a centralized repository of fundamental water rights, bring consistency to and fill the gaps in present water legislation, and streamline the existing administrative system.

In summary, a statutory system of water rights would (1) establish which of the conflicting water rights principles judicially enunciated are validly applicable in Hawaii, and (2) round out those principles into a comprehensive code.

The Commission deems it inappropriate to approve either of the conflicting water rights doctrines enunciated by the courts. It recognizes the complexity of Hawaii water law and realizes that the preparation of generally acceptable water rights legislation will entail considerable effort. But the need for such legislation is evident, and the Commission supports the inauguration of a study to develop a water code that includes a statutory system of water rights.

Some of the major shortcomings in water management—the lack of basic policies on private and public rights to water, overlapping administrative functions, limited and conflicting water use regulation, inadequate water development priorities, etc.—might thus be eliminated or minimized. The state could take a more active role in water management by statutory clarification and delineation of water rights and the establishment of an administrative system consistent with future needs.

Recommendation

- Commission an appropriate state agency to formulate for legislative adoption a state water code including a system of water rights having the desirable characteristics outlined above. (A draft of suggested authorizing legislation is presented as Appendix B.)

VI. INFORMATION NEEDS

Background

The hydrologic information needed for evaluation of water resources includes not only rates of rainfall, evapotranspiration, runoff, ground water recharge, and water quality attributes such as salinity, but also the definition of resource boundaries and the application of basic hydrologic principles within those boundaries.

An enormous body of hydrologic information has been accumulated in Hawaii, some of it dating back over a century. Yet, major inadequacies in this data are apparent when estimating some of the most critical parameters in water resource management. Information also needed for complete evaluation of a water resource includes the quality requirements and value of water for its potential use, and the technology, cost, and institutional aspects of water development.

As demands approach the sustainable yield of water sources currently developed, indicated in Chapter I of this report, there is a particular need for information on the availability of water from alternative sources, including wastewater, and the technology, cost, and institutional aspects of its development. Information is also needed on minimum flows required in natural water courses to maintain flora and fauna, aesthetic qualities, and recreational opportunities, as indicated in Chapter III.

Information of the type needed is produced by a number of research and monitoring programs maintained by government agencies and private organizations. However, critical water problems can be avoided in the future only if research programs on Hawaii's water resources and programs monitoring these resources are expanded, and if the information from these programs is used more effectively in planning and management than in the past. All agencies that will benefit from the results of the research and monitoring should contribute to their support, as recommended in Chapter VII.

Recommendations

- Accelerate and improve programs for gathering information on water resources, including potential yields, water conservation opportunities, water demands, methods and costs of water development, and environmental impacts of development.
- Improve means of putting available information to effective use in water management.

VII. FINANCING

Background

Spending for government services is a growing public concern at the state level and particularly so at the county level, where the revenue base is smaller. As a result, public financing of water programs and projects is becoming increasingly difficult. Alternative sources of funds need to be explored as the counties undertake water projects of expanded scope and as the state aggressively encourages diversified agriculture and aquaculture programs requiring the development of many separate water systems.

With increasing financial commitments, the state needs to review its overall water funding program, reassess its own financial capacity, and set realistic program goals.

Financial Planning. Requests for water project funds are usually presented to the Legislature in the following ways: (1) through the Administration's executive budget system, (2) through CIP requests of state departments, (3) through CIP requests of county water departments, and (4) through the initiative of the legislators.

Because of the absence of clear legislative policy on the subject, outlays for water programs and projects have not always been systematic. The 1978 Hawaii State Planning Act is expected to provide the basis for orderly authorization and financing of water programs and projects.

Cost-Sharing. State water resource development funds are now spent directly for state programs and projects and indirectly in support of county programs and projects. State water programs are primarily ancillary to programs for housing, agriculture, recreation, and conservation.

Domestic water systems installed by the state for land development are usually turned over to the counties for operation and maintenance. On the other hand, administration of irrigation water systems, built in conjunction with state agricultural parks, remains with the state. County water projects, particularly on the Neighbor Islands, are planned and constructed largely with state grants.

In line with growing federal practice, the concept of cost-sharing, heretofore not applied to state financing of water projects, should be considered. Besides requiring project beneficiaries to bear their share of the costs, this procedure would provide an incentive for the selection of worthwhile projects and permit direct involvement by beneficiaries in water project decisions. Cost-sharing formulas need not be uniform, but could be varied to suit the particular purposes and programs.

However, cost-sharing should not entirely supplant subsidies, which are justified when they serve some compelling social purpose or further some public policy.

Bond Financing. The issuance of general obligation bonds by the counties to pay for capital improvements must conform to constitutional and statutory debt limitations. Since water projects will continue to rely heavily on debt financing, borrowing costs of the counties could be reduced by the state's acquisition of county bonds, as now allowed by statute.

This mode of financing would be appropriate when counties face a disadvantageous interest rate in the bond market. Also, by encouraging such financing, state grants for county water system development would indirectly be reduced.

Federal Financial Assistance. Federal financial assistance to the state and counties is made under some 225 programs, including the 1972 program on general revenue sharing. Difficulties arise in trying to coordinate and man-

age the review of the various applications. Some water related grant programs require a state plan under which projects are reviewed for their relevance to other state plans and programs or to county plans and programs.

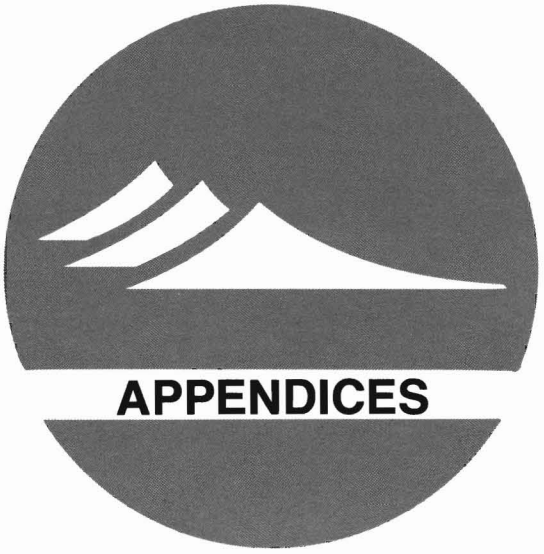
The Department of Planning and Economic Development, acting as the state clearinghouse for federal grants, processes the applications and affords other interested agencies an opportunity to comment. The forthcoming State Functional Plan on Water Development and complementary county development plans, required under the recently enacted Hawaii State Planning Act, will facilitate the processing of federal financial assistance applications for water programs and projects in Hawaii.

Conservation. Where water supplies are limited, conservation incentives are needed. It might be desirable to require community water conservation programs as a condition of state grants and subsidies for municipal water projects.

Research Funding. The estimation of sustainable yields and the appraisal of alternative ways to augment diminishing supplies of surface and ground water are increasingly important, particularly in those areas where demands are reaching or have reached the limits of yields sustainable with present technology. Water resources research and monitoring activities should be bolstered.

Recommendations

- Develop the State Functional Plan on Water Development to identify meritorious water programs and projects, set priorities, guide funding by the Legislature, and qualify for federal funds.
- Explore the feasibility of purchasing county bonds with state bond funds in order to reduce county borrowing costs and state grants for municipal water systems.
- Explore cost-sharing between the state and counties as a means of encouraging selection of the more efficient water programs and projects and requiring beneficiaries to share in the costs.
- Require institution of appropriate water conservation programs by the counties as a condition of grants and loans for municipal water supply and wastewater facilities.
- Bolster applied water research in the state through long-term contributions from those state and county agencies that stand to benefit.


APPENDICES

Appendix A

BILL FOR AN ACT TO REGULATE WATER USE

PART I - GENERAL PROVISIONS

SECTION 101. This Act may be cited as the Water Use Control Act.

SECTION 102. **Findings and Purpose.** The Legislature finds that, as Hawaii's population and economy continue to grow and as water demands approach the limits of sustainable yield, the development and use of the water resources of the state must be controlled to assure their continuing availability for beneficial use in the greatest public interest. Therefore, it is the purpose of this Act to provide for the control of the development and use of the water resources of this state through regulation by a Water Use Control Board.

Comment: *The aims of this general purpose section are: (1) to establish a general legislative policy, (2) to declare the public interest in the water resources of the state, and (3) to indicate the desirability and necessity of regulation under the state police power.*

SECTION 103. **Definitions.** In this Act, unless the context otherwise requires:

"Appurtenant water right" means a water use right initially pertaining to flow used for irrigation of taro land in cultivation at the time of the Great Mahele or for domestic use at that time.

"Available water supply" means the excess of sustainable yield from a water source over the current average rate of diversion or withdrawal from that source, including the estimated sustainable yield of an undeveloped or partially developed water source. (See "sustainable yield," "water development," "water source," and "water supply.")

Comment: *That quantity of water is "available" for use which may prudently and feasibly be diverted or withdrawn from fully developed, partially developed, and undeveloped water sources, after allowing for current beneficial uses.*

"Beneficial use" of water means any utilization that is reasonable and consistent with the public interest, including the following two general categories: (1) any utilization of a developed water supply, such as but not limited to domestic, municipal, military, agricultural, or industrial uses, including the generation of hydroelectric power; and (2) any use of a water resource in place that does not substantially interfere with natural flow and diminish volume or quality, such as but not limited to navigation, recreation, aesthetic appreciation, and the sustenance of fish, wildlife, and other organisms. (See "domestic use," "surface water," "water resource," and "water supply.")

Comment: *This definition establishes the basic standard governing the use of the water resources of the state. All uses of water which are in accord with the public interest are included within the concept, generally categorized as (1) those uses requiring water development, and (2) those uses that do not require water development. The term "beneficial use" is usually not defined in water statutes; but from its context in other statutes, the term is generally consonant with this definition.*

Iowa and Mississippi define "beneficial use" to include application of water for beneficial purposes inuring to the benefit of the user, but not including waste or pollution.

"Board" means the Water Use Control Board.

"Certificate" means an acknowledgment of continued use issued by the Board upon declaration by a person in accordance with the provisions of this Act.

"Continued use" means any individual domestic use, any use under an appurtenant water right, and any other use of water existing at the effective date of this Act or within three years prior thereto, or anticipated to serve facilities under construction on the effective date, subject to certification by the Board. (See "appurtenant water right" and "individual domestic use.")

Comment: *The term "continued use" is intended to categorize all existing uses for purposes of regulation by certification rather than permit procedures.*

"Convey" means to transfer ownership by deed, grant, bequest, devise, or any other legal means.

Comment: *This definition is meant to be all-inclusive, covering all legal means of transfer.*

"Domestic use" means any utilization of water to meet personal and household needs, including but not limited to: (1) drinking, bathing, laundering, cooking, and sanitation; (2) maintaining household pets; and (3) irrigating residential lawns and gardens. (Compare "individual domestic use.")

Comment: *"Domestic use" is restricted to the related needs of man. Consequently, commercial livestock production and irrigation of commercial crops are not included within this definition.*

"Emergency" means the existence or imminent probability of a water supply shortage so severe that the public health, safety, and welfare in a particular area of the state are endangered. (See "shortage.")

Comment: *"Emergency" is defined in terms of shortage (insufficient water supply) so severe as to endanger public health, safety, and welfare. The distinction between "shortage" and "emergency" is important, because under Part IV different powers are given to the Board under "shortage" conditions than under "emergency" conditions. Before the powers under an "emergency" can be exercised, it is a prerequisite that the Board find that its powers pertinent to "shortage" conditions are inadequate under the circumstances to protect the public health, safety, and welfare.*

"Federal government agency" means the United State government or any executive department, commission, independent establishment, or instrumentality thereof exercising powers which may affect the water resources of the state. (Compare "local government agency" and "state government agency.")

"General permit" means an authorization to develop and use water supplies from a generally defined water source or to use a generally defined water source in place, granted by rule or regulation of the Board without the necessity of an application. (See "water development," "water supply," and "water source"; compare "specific permit.")

Comment: *Provision for a "general permit" will enable the Board to issue permits for water use without the necessity of applications. Where the circumstances warrant such action, this will relieve the Board of administrative detail. Normally, it is anticipated that a general permit would be issued for source areas where available water supplies are sufficient for the permitted uses.*

"Ground water" means water located underground in the zone of saturation that moves freely to points of discharge (springs) and withdrawal (wells and tunnels), including but not limited to water from artesian and non-artesian sources, impounded by dikes, perched on geologic strata of low permeability, or floating on and displacing salt water, as well as the subflow of streams and underground streams; but excluding wastewater. (Compare "surface water.")

Comment: *This definition classifies all developable waters beneath the surface of the earth as "ground water."*

"Individual domestic use" means domestic use of water from a privately developed source by a single household or relatively few households. (See "domestic use.")

"Local government agency" means any political subdivision of this state exercising powers which may affect water resources, including any county, city, county department, or other instrumentality thereof, or soil and water conservation district.

"Person" means any individual, partnership, trust, association, joint-stock company, public or private corporation, or federal, state, or local government agency. (See "federal government agency," "local government agency" and "state government agency.")

Comment: *This is intended to be inclusive of all legal entities.*

"Shortage" means an insufficient water supply for current beneficial uses. (See "beneficial use" and "water supply"; compare "emergency.")

Comment: *The definition of "shortage" must be correlated with that of "emergency," since the "emergency" is defined in terms of "shortage" and since the two concepts interact in application under Part IV. See the definition of "emergency" and the comment thereunder. Also see Part IV and comments thereunder for application of "shortage" and "emergency" in context.*

"Specific permit" means an authorization to develop and use a water supply from a specific water source or to utilize a specific water source in place, granted by the Board upon application by a person in accordance with the provisions of this Act. (See "water development," "water supply," and "water source"; compare "general permit.")

Comment: *Under this Act, a permit system is utilized to regulate the development and use of a water supply (first category of "beneficial use") or use of a water source in place (second category of "beneficial use"). A "specific permit" requires application by a water user, whereas a "general permit" does not. See "general permit" and comment thereunder.*

"State government agency" means this state or any executive department, commission, independent establishment, or instrumentality thereof exercising powers that may affect water resources in this state, but does not include any local government agency. (See "local government agency"; compare "federal government agency.")

"Surface water" means any water flowing or stored upon the inland surface of the earth, including but not limited to the water in rivers, streams, canals, ditches, lakes, ponds, marshes, reservoirs, and overland flows; but excluding wastewater and reclaimed water. (Compare "ground water.")

"Sustainable yield" means the water supply that may normally be diverted or withdrawn from a water source at the maximum rate which will not unduly impair source utility, including the estimated yield from an undeveloped or partially developed water source. (See "water source" and "water supply.")

"Tunnel" is a horizontal excavation into which ground water percolates, flows, or seeps from or to the interstices of the rocks or soil which it penetrates, and/or which is used to transport a water supply. (Compare "well"; see "water supply.")

"Water development" means any method by which surface water is impounded within or diverted from its natural bed and banks or by which ground water is withdrawn from its source, and by which the resulting water supply is stored, transported, or treated in order to make it available for use. (See "ground water," "surface water," "water source," and "water supply.")

"Water resources" means all the ground water and surface water existing in its natural state within a particular area. (See "ground water" and "surface water.")

"Water source" means a place within or from which water is or may be developed, including but not limited to: (1) generally, an area such as a watershed defined by topographic boundaries, or a definitive ground water body; and (2) specifically, a particular stream, other surface water body, spring, tunnel, or well or related combination thereof. (See "ground water," "surface water," "tunnel," "water development," and "well.")

"Water supply" means the water diverted or withdrawn from a water source, or that might feasibly be diverted or withdrawn from an undeveloped or partially developed water source. (See "water development" and "water source.")

"Well" means a drilled vertical or inclined shaft or vertical excavation into which ground water percolates, flows, or seeps from or to the interstices of the rocks or soil which it penetrates, and/or which is used to withdraw a water supply. (Compare "tunnel"; see "ground water" and "water supply.")

SECTION 104. **General Regulation of Water Resources.** All development and use of the water resources in the state are subject to regulation under the provisions of this Act. After the effective date of this Act, no person shall develop any water supply or otherwise utilize water resources in the state except in compliance with the provisions of this Act, and no right, title, or interest in any water source or the use of any of the water supplies in the state can be acquired by means of prescription.

Comment: *This general provision makes all development and use of the water resources of the state subject to regulation under the Act and prohibits any person developing or making use of such water except in compliance with the Act. Consistent with this principle, no prescriptive water rights can be acquired after the date of this Act. The specific regulatory measures are contained in subsequent sections.*

PART II - WATER USE CONTROL BOARD

SECTION 201. **Water Use Control Board.**

(a) There is hereby created the Water Use Control Board, which shall be composed of nine members from the general public appointed by the Governor subject to confirmation by the Senate. The Governor shall appoint one member as chairman, and the chairman may designate from time to time any other member as acting chairman to serve during his absence.

(b) The members of the Board, to be selected and approved for appointment on the basis of their general knowledge of and experience with problems relating to the use of water, shall include five members from the state at large and one member from each of the four counties of the state, appointed by the Governor from a list of not less than three nominees from each of the counties designated by the respective mayors.

(c) The members of the Board shall serve for overlapping terms of six years, commencing on July 1 and expiring on June 30, except that (1) the terms of office of the members first appointed shall expire, as designated by the Governor, three at the end of two years, three at the end of four years, and three at the end of six years, and (2) any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed, shall be appointed for the remainder of that term. Within the first sixty (60) days of biennial sessions of the Legislature, successors shall be appointed to replace members of the Board whose terms of office shall expire on the first of July next thereafter and to fill vacancies for unexpired terms.

(d) The members of the Board shall serve without compensation, but shall receive the necessary traveling and other expenses incurred by them in the performance of their official duties out of appropriations made for operations of the Board.

Comment: *This section provides for the creation of a Water Use Control Board to administer this Act. Although it is intended that the members be knowledgeable and experienced in water use matters, use of the term "general public" connotes that members should not be water developers or employees thereof. Subsection (d) specifies service without compensation. However, compensation may be provided for if the legislature finds it warranted or desirable.*

SECTION 202. **General Powers.** To effectuate the purposes of this Act, the Board is authorized to:

(1) Issue certificates and general and specific permits for the development and use of water supplies or any other utilization of water resources within the state;

(2) Enter at all reasonable times upon any land without doing damage, for the purpose of investigating and studying water resources, water development, and water use;

(3) Establish committees to advise and make recommendations to the Board on research, policy, administration, and other matters;

(4) Appoint any officers and employees necessary to carry out the functions of the Board and to fix their compensation in accordance with salary standards adopted by the Department of Personnel Services;

(5) Issue rules, regulations, or orders requiring the filing of plans, drawings, specifications, information, or reports regarding any aspect of water development and use by all water users, whether or not required to have a certificate or permit under this Act;

(6) Establish rules and regulations concerning notices, hearings, and proceedings under the provisions of this Act;

(7) Seek judicial enforcement of the provisions of this Act or any rule, regulation, or order of the Board;

(8) Act for the state, as directed by the Governor, in the control of water development and use involving federal interests; and

(9) Utilize the services or personnel of any federal, state, or local government agency, with its consent.

Comment: *This section enumerates nine general powers that form a reasonable framework for the Board to properly regulate water development and use in the state. In order to achieve these objectives the Board has the power to seek judicial enforcement of any provisions of the Act (subsection 7).*

Subsections (3), (4), and (9) permit the Board to set up advisory committees to assure local cooperation and interest, appoint a competent professional staff with sup-

port personnel, and seek the expertise and services of other government agencies to better carry out its functions.

SECTION 203. **Rules and Regulations.**

(a) The Board may make, amend, and rescind any rules, regulations, forms, and orders necessary to carry out the provisions of this Act, including rules and forms governing declarations, applications, and reports and defining any pertinent terms consistent with the provisions and intent of this Act.

(b) For purposes of rules, regulations, forms, and orders, the Board may classify persons and matters within its jurisdiction and prescribe different requirements for different classes.

Comment: *Subsection (a) is a common type of provision granting the Board authority to establish operational guidelines. Subsection (b) grants explicit authority to make reasonable classifications to meet divergent circumstances and better effectuate the purposes of the statute.*

SECTION 204. **Action of Other Government Agencies.**

(a) No state or local government agency may enforce any ordinance, rule, or regulation that affects the development and use of water resources controlled under the provisions of this Act, whether promulgated before or after the effective date hereof, without written approval of the Board.

(b) No state or local government agency or other person may exercise the power of eminent domain or condemnation against any water rights within the state without written consent of the Board.

Comment: *This section is intended to assure a unified and comprehensive system of water regulation. Subsection (a) requires all other government instrumentalities dealing with water resources to obtain Board approval of pertinent rules, regulations, or ordinances. This serves to prevent conflicting policies and standards at the several government levels.*

Subsection (b) carries out this principle of unified state policy and administration by granting the Board overriding control over the power of eminent domain affecting water rights.

SECTION 205. **Investigations.** The Board may in its discretion:

(1) Make such investigations as it deems necessary (a) to determine if any person has violated or is about to violate any provision of this Act or any rule, regulation, or order of the Board, and (b) to aid in enforcing this Act or in formulating rules, regulations, or orders therefor;

(2) Require or permit any person to file a statement concerning any facts and circumstances within his knowledge relevant to the matter under investigation; and

(3) Publish information concerning any investigation made pursuant to this Act.

Comment: *This section provides the Board with fairly broad investigative powers necessary to ascertain any violations of the Act and to assist the Board in its administration and enforcement. These powers will enable the Board to ascertain the actual water use situation in the state, whether agency rules and regulations are wise, and whether the provisions of the Act and actions of the agency are being enforced.*

SECTION 206. **Subpoenas.**

(a) For the purpose of any investigation or proceeding under this Act, the Board or any officer or employee designated by it may administer oaths and affirmations, subpoena witnesses, compel their attendance, take evidence, and require the production of any books, papers, correspondence, agreements, or other documents or records which the Board deems relevant or material to the inquiry.

(b) In case of a refusal to obey a subpoena issued to any person, the circuit court of the circuit in which the property affected is situated, upon application of the Board or its representative, may issue an order requiring compliance. Failure to obey the order of the court may be punished as a contempt of court.

SECTION 207. **Injunctive Relief.** The Board may institute a civil action in any court of competent jurisdiction for injunctive relief to prevent any violation of this Act or any rule or regulation made hereunder. The court shall have power to grant relief in accordance with the Hawaii rules of civil procedure.

Comment: *This is a common provision affording the Board adequate enforcement powers by permitting it to bring an action in court to restrain contemplated or actual violations of the Act.*

SECTION 208. **Hearing Procedures.**

(a) The Board shall hold a hearing upon the request of any person adversely affected by a rule, regulation, or order of the Board.

(b) In any hearing under this Act, the Board shall admit as a party any person whose interest may be adversely affected.

(c) The provisions of the Hawaii Administrative Procedure Act, HRS, Chapter 91, shall apply to all proceedings of the Board under this Act.

Comment: *This section is a procedural safeguard for all persons who have been or might be aggrieved by action of the Board. Subsection (a) permits any aggrieved person to obtain a hearing. Subsection (b) mandates the Board to admit as a party in interest to all hearings under the Act any person who may be adversely affected by the outcome. Subsection (c) is a standard requirement for all state government agencies.*

PART III - CERTIFICATES AND PERMITS

SECTION 301. **General Provisions.**

(a) After the effective date of this Act, except as provided in this Part, any development of water supplies or any other use of water resources within the state shall be in accordance with a certificate or permit issued by the Board.

(b) The Board is authorized to issue certificates, to grant general and specific permits, and to differentiate among classes thereof and certification and permit procedures, as hereinafter provided.

(c) A certificate or specific permit may be transferred from one water user to another with notice to the Board, provided that the water development facilities, quantity or rate of water diversion or withdrawal, and the nature, time, and place of use are not changed.

(d) All water development and use, regardless of certificate or permit conditions, shall be subject to the shortage and emergency powers of the Board under Part IV of this Act.

(e) After the effective date of this Act, (1) no state or local government agency shall contract to obtain a water supply from any person who does not hold a certificate or permit providing therefor, unless written permission is obtained from the Board by the agency; and (2) no person shall contract to supply water to another person except under the conditions of a certificate or permit providing therefor.

Comment: *This section brings under state control by certification and permit all water development and use in the state. It does not require a certificate or permit for the taking, storage, or utilization of water by a consumer from a public or private supplier who must have a permit under this Act.*

Subsection (b) enables the Board to issue certificates and to grant either specific or general permits. Certificates are to be issued to register existing uses. General permits are to be granted by rule of the Board where specific permits are not necessary. Specific permits will be required in areas of the state where detailed management and regulation are necessary. Operational efficiency in issuing certificates and permits will be facilitated by use of classifications whereby declarations and applications of similar character may be handled easily and treated uniformly.

The purpose and effect of Subsection (e) is to prohibit state and local government agencies, without the consent of the Board, from contracting for a water supply from persons whom the Board does not control by certificate or permit.

SECTION 302. **Continued Uses.**

(a) The Board shall provide by certification for continuance of beneficial uses of water in existence at the effective date of this Act or within three years prior thereto, or anticipated to serve facilities under construction on the effective date, provided that the uses remain beneficial.

(b) Certificates for such continued uses shall not be limited in duration.

(c) A certificate for continued use as provided in this section, except for a use under an appurtenant water right, may be revoked either wholly or in pertinent part as provided in Section 311 if use is not actually continued for four consecutive years or for any five out of seven years after issuance of such certificate. Years of non-use caused by a shortage or excess of water due to natural conditions will not be considered in computing the period of non-use.

Comment: *Subsection (a) allows by certification for continuance of beneficial water uses existing at the effective date of the Act. This will record priority rights to*

beneficial use and establish a data base from which to ascertain available water supplies. Subsection (b) provides for an unlimited duration. However, subsection (c) provides for expiration because of non-use, thereby avoiding control of water resources by mere paper rights.

SECTION 303. **Certification Procedures.**

(a) Within one year after its appointment, the Board shall provide by rule or regulation for the registration of any continued use authorized under Section 302 by filing a declaration with the Board in the manner and form prescribed.

(b) The Board may divide the state into areas and specify different dates within which to file such declarations.

(c) The Board shall cause notice of the rule requiring such declarations to be given by publication once each week for the three weeks prior to the effective date of the rule in a newspaper of general circulation in the areas concerned.

(d) The Board shall also cause notice of such rule to be given by certified mail to any person required to file a declaration of whom the Board has or can readily obtain knowledge or who has requested that mailed notice be given upon the adoption of such rule.

(e) The declaration shall be in such form and contain such information as prescribed by rule, including but not limited to the water source and water development facilities, the quantity or rate of water diversion or withdrawal, and the nature, time, and place of water use.

(f) Upon filing the declaration, the continued water use described therein shall be deemed registered, subject to certification.

(g) If no declaration of continued use is timely filed by the person entitled thereto, the Board may tentatively ascertain the information required by investigation or estimate, register such use by rule or order, and notify the user.

(h) Within such period after registration of a continued water use as prescribed by rule, but not later than five years after the effective date of this Act, the Board shall verify to its satisfaction the accuracy of the declaration or preliminary determination under subsection (g), ascertain that the use is beneficial, and certify continued use by issuance of a certificate.

(i) In the event that the Board should not issue a certificate within the time prescribed, the continued use registered as provided in this section shall be deemed certified, and the Board shall issue a certificate upon written request therefor.

(j) The Board shall hold a hearing upon the written request of any person adversely affected by the certification or the failure or refusal to certify any continued use as provided in this section.

(k) Unless authorized by the Board, no such continued uses may be modified by increasing the quantity or rate of water diversion or withdrawal, or by changing the nature, time, or place of water use; provided, however, that insubstantial modification as defined by rule may be authorized without notice or hearing upon order of the Board; and provided, further, that the Board shall hold a hearing upon the written request of any person adversely affected by such order.

(l) Until such time as subsection (a) is implemented, the Board may provide for interim registration, subject to affirmation or reregistration upon implementation of subsection (a).

Comment: *Subsections (a) to (f) provide for registration of continued uses by declaration of the water user entitled thereto, in accordance with rules and regulations adopted by the Board. Should such declaration not be timely filed, subsection (g) allows the Board to register continued uses of its own initiative by rule (with hearing) or order (without hearing).*

Within a reasonable time after registration, considering workload and manpower constraints, the Board should determine whether the registered use is beneficial, verify the facts contained in the filed declaration or tentatively ascertained for registration by rule or order, as provided in subsection (h). Thereupon, certificates will be issued to users based upon verified information.

Subsection (i) will entitle a registered use to be certified in any event within the time specified for verification in accordance with subsection (h), whether or not the declaration or preliminary determination by the Board under subsection (g) has actually been verified. Subsection (j) provides due process for anyone adversely affected by certification procedures. Changes in use are controlled under provisions of subsection (k).

Subsection (l) is a transitional provision intended to accommodate water users who wish to register continued uses prior to the promulgation of rules and regulations pursuant to subsection (a).

SECTION 304. **Permitted Uses.**

(a) Development or use of any water source in

the state may be initiated after the effective date of this Act only in accordance with a general or specific permit granted by the Board, as provided in Section 305.

(b) A general permit may be granted by rule or regulation of the Board for a particular beneficial use or uses in a specified area or areas where available water supplies are sufficient.

(c) A specific permit shall be granted only upon filing a written application with the Board in the form and manner prescribed.

(d) Each permit granted under this section shall be for a reasonable period as determined by rule, regulation, or order of the Board.

(e) A specific permit as provided in this section may be revoked either wholly or in pertinent part if the permitted use is not actually continued for four consecutive years or for any five out of seven years after issuance of such permit. Years of non-use caused by shortage or excess of water due to natural conditions will not be considered in computing the period of non-use.

Comment: *Subsection (a) provides for granting of permits for water uses initiated after the effective date of the Act.*

Under subsection (d), each permit granted is of limited duration, unlike certificates issued under Section 302. This limitation insures periodic reevaluation of the beneficial character of the permitted use. The duration of the permit will be determined by the Board in the public interest. The period of the permit should be sufficiently long to allow recovery of investments and repayment of bond issues.

SECTION 305. **Permit Procedures.**

(a) Within one year after its appointment, the Board shall provide by rule or regulation for the authorization of uses permitted under Section 304 in accordance with prescribed forms and procedures.

(b) An application for a specific permit shall specify the water source and water development facilities, the quantity or rate of water diversion or withdrawal, and the nature, time, and place of water use, and shall contain such other information as may be required to determine: (1) the merits of the proposed water development and use; (2) any hazards to public health, safety, or welfare entailed by such use; (3) the impact, if any, upon existing uses; and (4) any qualifications of the applicant deemed appropriate to effectuate the purposes of this Act.

(c) Within 60 days after the filing of any application for a special permit, the Board shall hold a public hearing on the application and cause notice thereof to be given by publication at the applicant's expense once each week for the three weeks prior thereto in a newspaper of general circulation in the county where the water source is located.

(d) The Board may also require the applicant to mail notices of the application to any state or local government agency that may be affected.

(e) Any person who is or may be adversely affected by the approval or disapproval of such application shall have a right to be heard.

(f) The Board shall either approve or disapprove each application within one year from the date of public hearing; provided, however, that (1) action may be postponed by the Board upon written authorization of the applicant or, in the case of a contested application, by both the contestant and the applicant; and (2) in an area where a water supply study is in progress or where court action is pending, the Board may withhold action upon the application until such time as the study is completed or final judgment is entered in the court action.

(g) The foregoing procedures shall also pertain to the modification of a permit upon application for a change in water development facilities, increase in the quantity or rate of water diversion or withdrawal, or change in the nature, time, or place of water use; provided, however, that insubstantial modification as defined by rule may be authorized without notice or hearing upon order of the Board; and provided, further, that the Board shall hold a hearing upon the written request of any person adversely affected by such order.

(h) Until such time as subsection (a) is implemented, the Board may grant an interim general or specific permit, subject to reconsideration and ratification or modification with notice and hearing upon the implementation of subsection (a).

Comment: *Subsection (b) specifies essential information to be contained in applications for permits. Subsections (c) and (d) provide notice to interested parties and to state and county agencies to represent the public interest. Subsection (e) assures that any person or government agency affected can participate in a hearing. Subsection (f) requires the Board to act on an application*

within a specified time, but allows for postponements under certain circumstances. Subsection (g) provides for amendment of specific permits, allowing expedient procedures for minor modifications.

Subsection (h) is a transitional provision to accommodate applicants in the interim between the appointment of the Board and the promulgation of procedural rules.

SECTION 306. **Guidelines for Granting Permits.** In granting, determining the duration of, and modifying general and specific permits under Section 304, the Board shall be guided by the following considerations:

(a) The purpose of this Act and the Board's general objective is the most beneficial use of all water resources in the state.

(b) A permit may be granted if: (1) the available water supply is adequate; (2) the use of the water will be beneficial; and (3) granting the permit will not substantially and materially interfere with uses previously registered, certified, or permitted.

(c) In determining the public interest in the development, utilization, protection, and conservation of water, the Board shall give due consideration to the State Functional Plan on Water Resources.

(d) Where an application seeks to transport and use surface water outside the watershed from which it is diverted or ground water outside the basin from which it is withdrawn, consideration shall be given to the needs of the source area and the availability of alternate sources.

(e) Where a future use of water can be identified with a particular project, is clearly in the public interest, and is consistent with the State Functional Plan on Water Resources, provisions may be made to reserve an available water supply for such future use; provided, however, that permits for unrelated uses of the reserved water may be granted in the interim.

(f) In granting permits for surface water development and use, the Board shall consider maintenance of minimum streamflows and water levels to protect water quality; to sustain fish, wildlife, and other organisms; and to preserve aesthetic values and recreational opportunities. Permits may be granted for such ecological and social purposes as affirmative protective measures.

(g) Permits may be granted whether or not, under prior law, the permitted use would have been authorized only in relation to specific lands or a particular watershed or basin.

(h) When there are competing applicants for an available water supply, the Board shall give no preference or priority to applications first in time, but shall be governed by the standard of beneficial use.

Comment: *Subsection (a) enunciates the general principle of maximum beneficial use of water resources in the state. Subsection (b) sets forth specific criteria for granting the permit. Subsection (b)(1) prevents the granting of permits when the available water supply is inadequate. Subsection (b)(2) reiterates the traditional criterion of beneficial use. Subsection (b)(3) protects existing uses from substantial and material interference by the new user, thereby insuring stability and certainty necessary to encourage investment in water development.*

Subsection (c) requires that the allocation of water be reasonably consistent with the purposes and proposals of the state water plan. The Board might reject an application substantially inconsistent with that plan or significantly detrimental to its objectives.

Subsection (d) requires that in considering any application to export water from the originating watershed or basin, the Board shall determine whether the available supplies would ultimately be required within the source area and whether alternative water sources would be practical. The public interest might be better served if the applicant is required to develop available water supplies in the area of proposed use.

Subsection (e) provides that when future water use can be identified with a planned project, a sufficient water supply can be reserved to assure the project's success. This provision would generally be applicable to the larger water purveyors, such as the county boards of water supply, who require substantial lead time in planning and constructing projects.

Subsection (f) gives the Board the right to approve conditionally or even disapprove applications if the proposed use of water would destroy a waterfall, dry up a stream, ruin public recreation, or otherwise adversely affect the ecological and social values of surface water sources. Permits for the affirmative protection of such values could be granted in the same manner as that employed under this Act to create private rights in water development and use. This would allow government agencies authorized to establish standards for the maintenance of instream values to apply for permits to preserve such values.

Subsection (g) provides for the most beneficial utilization of water resources in the state without limitations

developed by the courts under common law doctrines. Subsection (h) is suggested to assure that the prior appropriation theory adopted by western states has no application in Hawaii.

SECTION 307. **Standard Permit Conditions.** Each permit granted by the Board under Section 304 shall contain and be subject to the following conditions:

(a) The water must be developed and used in the designated area for the beneficial use described in the permit;

(b) The development and use authorized by the permit must not interfere substantially and materially with uses previously registered, certified, or permitted, except as provided in this Act;

(c) The permit may expire or be revoked in accordance with the provisions of this Act; and

(d) Such other conditions as the Board may establish by rule or regulation to effectuate the purposes of this Act.

Comment: *This section establishes the conditions to be set forth in all permits granted by the Board. Subsection (a) prevents deviation from the purpose for which the water is developed. Subsection (b) reiterates Section 306(b)(3). Subsection (c) relates to the powers of revocation of the Board under Section 311.*

SECTION 308. **Permit Condition in Event of Use Interference.** Where application is made for a permit under Section 304 and there is a sufficient water supply available, but the use under the permit would interfere substantially and materially with a use previously registered, certified, or permitted, the Board may issue a permit conditioned that the permittee furnish to the affected previous user a quantity and quality of water or power equal in value or other important characteristics to that lost because of the interference.

Comment: *This section suggests the adoption of the principle of "replacement" or "compensation in kind" to enable expanded development of available water supplies. Existing use patterns, if absolutely protected against interference by subsequent users, might prevent increased development of available water supplies. This section allows the new permittee to make use of the water available so long as prior users are accommodated.*

SECTION 309. **Expiration and Renewal of Specific Permits.**

(a) An application for renewal of a specific permit under Section 304 may be filed after one-half the term of the existing permit has expired.

(b) If a specific permit is for a term exceeding one year, and an application for renewal is not filed six months prior to the expiration date, the Board shall thereupon notify the permittee forthwith by certified mail that the permit will expire at the end of its term unless an application for renewal is filed with the Board at least four months prior to the expiration date.

(c) The provisions of Sections 305 to 307 shall apply to applications for renewal of permits.

(d) The term of a renewed permit shall commence upon the expiration of the term of the existing permit.

(e) If an application is not filed for renewal of a specific permit at least four months prior to its expiration date, the Board may then consider an application from another person for a permit to develop and use the water supply sanctioned under the existing permit, to become effective upon expiration of the existing permit.

Comment: *In order to safeguard the security of his investment, a permittee is advised pursuant to this section of the deadline for renewal of his permit. The deadline in subsection (b) is suggested as a method to avoid the non-use of water during pendency of applications, and also to allow planning by the Board for the future use of the water.*

SECTION 310. **Permit Fees.** The Board is authorized to establish reasonable fees for the issuance of specific permits under Section 304.

Comment: *This section provides for a fee system whereby some or all of the administrative costs of issuing permits may be financed.*

SECTION 311. **Revocation of Certificates and Permits.**

(a) A certificate issued under Section 302 may be revoked either wholly or in pertinent part for non-use, as specified in subsection 302(c).

(b) A permit granted under Section 304 may be revoked either wholly or in pertinent part: (1) for any materially false statement in the application or in any report or statement of fact required pursuant to the provisions of this Act; (2) for violation of the provisions of this Act; (3) for violation of the conditions of the permit; or (4) for non-use, as specified in subsection 304(e).

(c) In any proceeding to revoke a certificate or permit, either wholly or in pertinent part, the Board shall give the certificate or permit holder written notice by certified mail of the facts or conduct which appear to warrant such action and provide an opportunity for a hearing.

Comment: *In order to assure effective control of water development and use, it is necessary that the Board have power to revoke permits. Subsections (a) and (b)(4) authorize the Board to revoke a certificate or permit for non-use so that another applicant might use the water. Subsection (b)(1), (2), and (3) are sanctions imposed for malfeasance. Subsection (c) assures due process.*

PART IV - WATER SHORTAGES AND EMERGENCIES

SECTION 401. **Water Shortages.**

(a) Upon finding and declaring that a water shortage exists or is imminent in any area of the state, the Board may promulgate rules, regulations, or orders to achieve the most beneficial use of water supplies under the circumstances and to safeguard the interests of water users affected.

(b) Appropriate measures under shortage conditions may include but are not limited to: (l) forbidding the construction of new water development facilities or the modification of existing facilities; (2) prohibiting new water uses, the modification of existing uses, or the continuance of those uses which the Board finds have ceased to be beneficial; and (3) apportioning, limiting, or rotating uses of the water supplies.

(c) Continued uses registered or certified under Section 302 shall be given preference over uses permitted under Section 304, in the following priority: (1) domestic uses; (2) uses under appurtenant rights; and (3) other continued uses.

(d) Among permitted uses that are substantially similar, the Board shall give preference to those initiated prior in time, unless the Board determines that such preference would impair or be detrimental to the public interest.

(e) Upon the petition of any person adversely affected, the Board shall hold a hearing to determine whether a shortage has terminated, a threatened shortage is no longer imminent, or any rules, regulations, or orders promulgated under this section should be amended, repealed, or revoked.

Comment: *When water supplies are inadequate for current uses, this section grants to the Board special powers (1) to administer the water supplies according to the standard of most beneficial use, (2) to determine a method of allocating water, and (3) to provide preferences for specified uses. The preference for domestic use in subsection (c) is found in many water codes. Subsection (d) provides a preference among similar permitted uses for those initiated prior in time. This is the only place in the Act that a doctrine of priority is employed to determine preference among permittees. Subsection (e) assures that the special powers of the Board in times of shortage will not be employed any longer than is necessary to cope with the problem.*

SECTION 402. **Emergency Powers.**

(a) Upon finding that a water shortage is or threatens to be so severe in any area of the state that the powers under Section 401 are inadequate to protect the public health, safety, and welfare, the Board may declare an emergency and promulgate such rules, regulations, or orders in addition to those applicable to shortage conditions as may be necessary for the protection of the public during the emergency.

(b) Upon declaring an emergency, the Board may authorize any affected state or local government agency or public water supplier to enter upon public or private lands and develop for the duration of the emergency that quantity of water of suitable quality necessary to protect the public health, safety, and welfare.

(c) On the petition of any person adversely affected, the Board shall hold a hearing to determine whether the emergency has terminated or whether any rules, regulations, or orders promulgated under this section should be amended, repealed, or revoked.

Comment: *This section is effective only in the event that the powers granted to the Board under Section 401 to control shortages are inadequate to protect the public health, safety, and welfare. The special powers granted under this section are limited to agencies which represent the interests of the public. Subsection (c) insures against unnecessary use of the emergency powers by the Board.*

PART V - MISCELLANEOUS PROVISIONS

SECTION 501. **Criminal Penalties.** A violation of any provision of this Act or any rule, regulation, or order issued by the Board shall constitute a violation as defined in the Hawaii Penal Code, Section 701-107, and shall be enforceable by police officers. The fine for this violation shall be not less than $25 nor more than $2,500 for each separate offense. Each day of violation shall constitute a separate offense.

SECTION 502. **Severability.** If any provision of this Act or the application thereof to any person or circumstance is held invalid, the invalidity shall not affect other provisions or applications of the Act which can be given effect without the invalid provision or application, and to this end the provisions of this Act are severable.

SECTION 503. **Repeal.** All existing laws or parts of existing laws of this State inconsistent herewith are superseded. Specifically, Chapter 177, HRS, is repealed as of the effective date of regulations promulgated by the Board pursuant to this Act.

Comment: *Chapter 177, HRS, is the Ground Water Use Act, administered by the Department of Land and Natural Resources.*

SECTION 504. **Funding.** Such sum as may be necessary for the purpose of this Act shall be appropriated from the general funds of the state.

SECTION 505. **Effective Date.** This Act shall take effect _____.

Appendix B

BILL FOR AN ACT AUTHORIZING A STATE WATER CODE

SECTION 1. **Statement of Need.** The legislature finds that water legislation in Hawaii, enacted piecemeal over the years as needs dictated, is inadequate to deal with current and emerging water management problems. Administrative duties have been fragmented among agencies with different interests, and often services have been duplicated. Changes in technology, economic circumstances, administrative concepts, and social values have rendered much of the legislation inappropriate or obsolete. More significant is the absence of legislation needed to settle the common law and to cope with changing conditions in this growing state. There is no comprehensive policy defining respective public and private water rights. A state water code would remedy to a large extent the above-cited shortcomings in Hawaii's present water law.

SECTION 2. **Function of the Water Code.** The state water code is intended to be a permanent repository of carefully considered fundamental principles and policies from which all private and public water rights, all pertinent administrative powers, and all supplementary rules and regulations logically flow. The code would serve two basic functions: (1) recognize, clarify, and systematize legal concepts, and (2) establish a basic administrative framework and assign or reassign functions to existing or new agencies.

SECTION 3. **General Guidelines.** The code should include only fundamental matters of policy, principles, rights, and administration that will have continuous application and will not require frequent amendment. Accordingly, the following key provisions are suggested:

(a) **Rights in Natural Waters.** Appropriate provisions of the code should:

(1) Assert the state's sovereign authority to regulate the development and use of all water resources within its boundaries in the public interest;

(2) Provide a sound basis for comprehensive state regulation of water development and use so as to assure continuity of sufficient water supplies of appropriate quality from surface water and ground water sources;

(3) Give full consideration to hydrologic principles and to ecological and social values in the regulation of water development and use;

(4) Adequately safeguard both private and public investments in, and dependence upon, water development for beneficial use;

(5) Provide as appropriate for additional public and private water development for beneficial use within the limits of sustainable yields;

(6) Provide for the proper certification, licensing, protection, and measurement of various water uses; and

(7) Provide bases for appropriate transfers of water rights and for appropriate transportation of water.

(b) **Administrative Structure.** Provisions of the water code should also:

(1) Designate or establish those administrative agencies responsible for conserving, developing, and controlling the use of water;

(2) Define agency roles and objectives;

(3) Confer necessary powers upon designated agencies; and

(4) Provide for agency organization.

SECTION 4. **Formulation of Water Code.** (a) The [*state agency*] is hereby charged with the duty of formulating a state water code, following, but not limited by, the general guidelines set forth in Section 3, for consideration and adoption by the legislature.

(b) In order to accomplish this purpose, the [*state agency*] shall invite the participation of the general public, water users and purveyors, and concerned public or private agencies, and may undertake any studies, services, or analyses deemed relevant, through the use of its own personnel or in cooperation with or by agreement or under contract with any other public or private entity.

SECTION 5. **Report Submittal.** The [*state agency*] is directed to submit to the legislature a report of its findings and recommendations, together with a proposed water code, no later than thirty days prior to the convening of the third regular session following the effective date of this Act.

SECTION 6. **Funding.** The sum of $300,000 is hereby appropriated to the [*state agency*] to carry out the provisions of this Act.

GEORGE R. ARIYOSHI
Governor