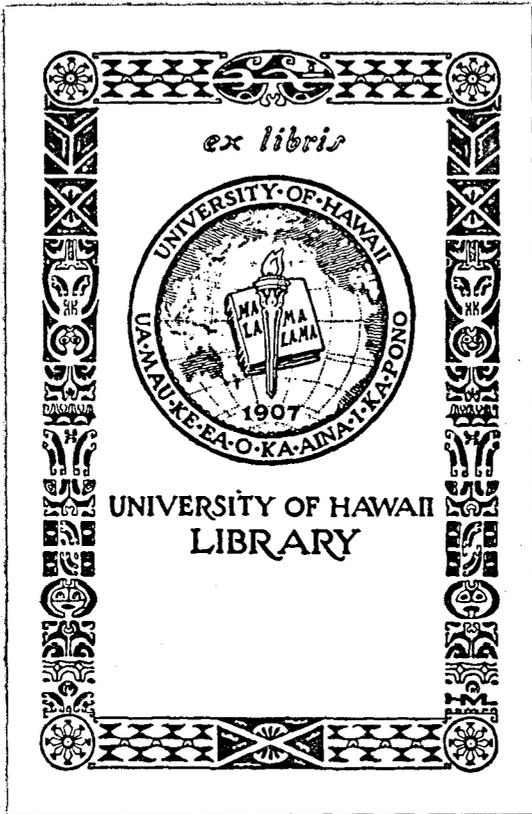


SUMMARY REPORT ON THE PROGRAM OF THE HAWAII IRRIGATION  
AUTHORITY.

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SUMMARY REPORT ON THE PROGRAM

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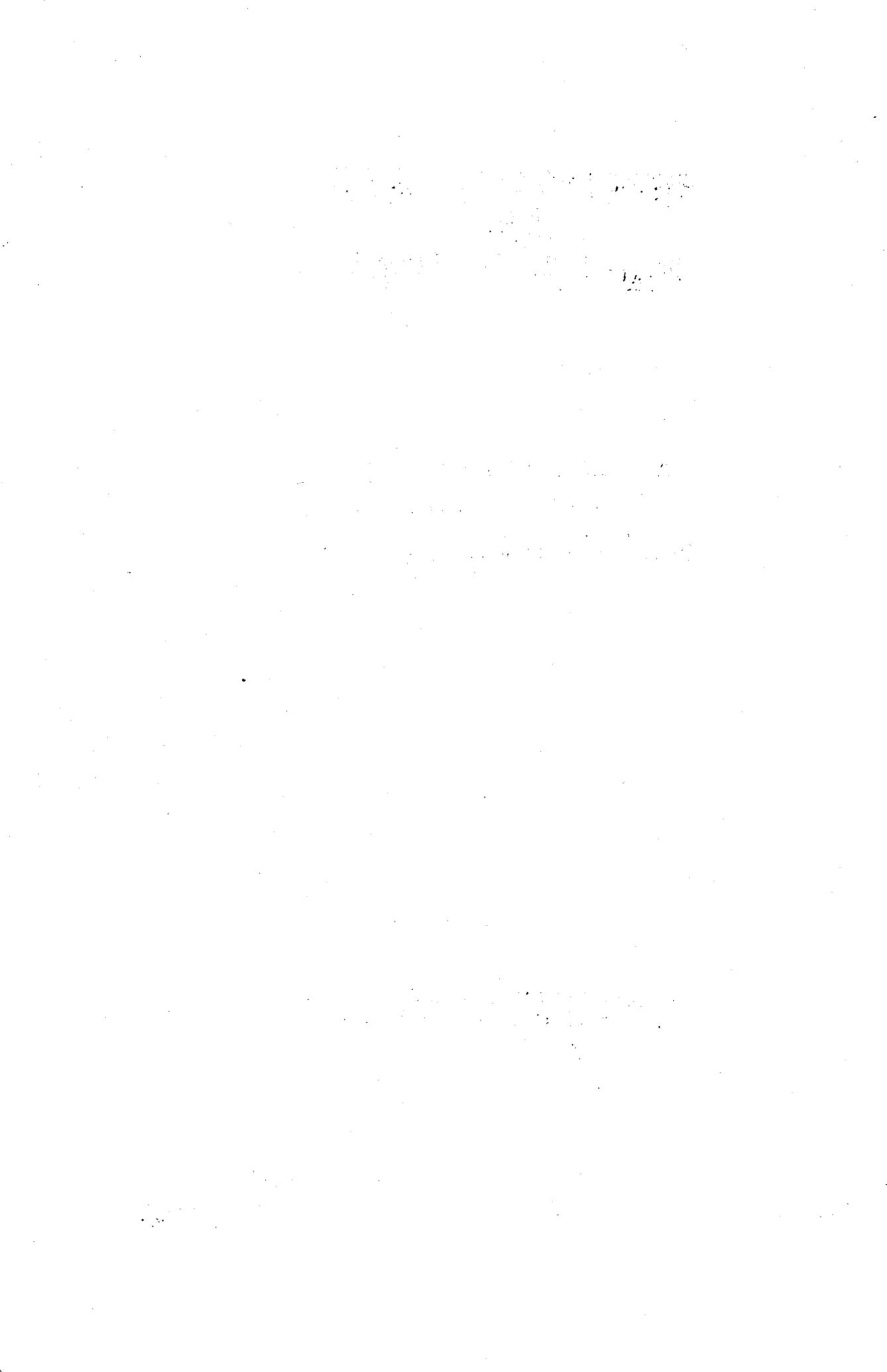
HAWAII IRRIGATION AUTHORITY

Prepared for the Meeting of the  
Members of the Territorial Legislature  
To be Held in Hilo -- April 21, 1956

Hawaii (Terr.) HAWAII IRRIGATION AUTHORITY  
Territory of Hawaii

April 21, 1956

L. H. HERSCHLER  
Manager-Chief Engineer



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SUMMARY REPORT ON THE PROGRAM  
OF THE HAWAII IRRIGATION AUTHORITY

Prepared for the Meeting of the  
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The first and second annual reports of the Hawaii Irrigation Authority cover in some detail the activities of the Authority through the year 1955. Copies of these reports have been furnished heretofore to all members of the Twenty-eighth Legislature. This summary report has been prepared as a brief review of the current program of the Authority to give the status of the various irrigation projects in operation, under construction or being studied, and to point out some of the legislative problems affecting the Authority's operations. It is hoped that this information will be helpful to the members of the Legislature in reviewing the Territory's current irrigation program prior to their meeting scheduled for April 21 at Hilo.

Legislative Authorization - Administration

The Hawaii Irrigation Authority was created by the Irrigation Act (Act 245) enacted by the Twenty-seventh Legislature in 1953 for the purpose of supplying additional water, either from untapped sources or by

the further development of existing sources, to promote the development of small scale farming and the over-all production of agricultural products in the Territory. To carry out this purpose, the Act contemplates that the Authority shall make studies and investigations and undertake the construction and operation of irrigation projects upon receipt of proper petitions from land owners, upon requests by either the Territorial Commissioner of Public Lands or the Hawaiian Homes Commission, or upon the Authority's own initiative. The economic and engineering feasibility of projects must be determined before construction is undertaken and water charges must be fixed at the lowest possible rates. No projects are to be operated at a profit, or as a source of revenue for the Territory.

To carry out the administrative and investigative provisions of this Act a revolving fund of \$500,000 was established by the Legislature in 1953. The Act also provides for the financing of construction of irrigation projects through either the sale of revenue bonds or by Legislative appropriations to be repaid without interest to the general funds of the Territory. The Authority is required to obtain Federal aid for irrigation projects whenever possible.

The Irrigation Act, in addition to setting up a procedure for the establishment of new irrigation projects, also turned over to the Authority the responsibility for the administration of the Waimea Irrigation and Water Utilization Project, Act 240, (Series E 261), S.L.H. 1951, and the administration of the Molokai Irrigation and Water Utilization Project, Chapter 317 of the Revised Laws of Hawaii 1945. Since these two projects are authorized by specific legislation, their administration differs somewhat from that of projects undertaken pursuant to the provisions of the Irrigation Act.

The five Commissioners, appointed by Governor King in 1953, and still serving in this capacity with the Authority, are as follows:

Ben E. Mutter, Chairman  
A. Lester Marks, Vice Chairman  
Arthur Y. Akinaka, Secretary  
James S. Beatty, Commissioner  
E. C. S. Crabbe, Jr., Commissioner

The Commissioners have held regular monthly meetings and have devoted considerable time and attention to establishing policies and directing the broad phases of project planning. They have made several field trips and have shown a keen interest in the irrigation program throughout their terms of office.

#### Personnel

The work of the Authority actually got under way with the hiring of the first staff employee in September 1953. Subsequently, additional employees were attached to the staff but not without considerable difficulty in recruiting under the existing short supply of engineers. The Territory's salary schedule is not high enough to compete with Federal agencies nor to attract irrigation engineers from plantation employment. Although experienced irrigation engineers from outside the Territory have expressed a desire to work for the Authority, existing civil service regulations do not permit such hiring.

Notwithstanding this situation, the Authority has been able to recruit an engineering staff of nine engineers and two draftsmen, mostly from other Territorial Departments and from the City and County government of Honolulu. While the past experiences of these employees have not been in irrigation work or hydrology, but rather in other civil engineering fields, such as highway and airport planning and city improvement work, the Authority has been able to provide training during

the past two years to effect a competent irrigation engineering group. Our major handicap at present is in the field of engineering report writing.

In addition to engineers the Authority has four clerical and fiscal employees in the Honolulu office and a field organization of eight employees operating the Waimanalo irrigation system on Oahu. The Department of Public Works assists the Authority by furnishing construction supervisors and inspectors, surveyors, and making necessary laboratory tests. The Authority reimburses the Department for such personal services.

In this summary report, it may seem that undue emphasis has been placed on the recruiting of an engineering staff for the Authority; but, if so, it is because this problem has been one of the most difficult and time consuming ones with which the Authority has had to contend. Procurement of qualified engineers for Territorial employment is a critical problem today, one which is deserving of serious consideration by the next Legislature. It affects not only the Irrigation Authority but also all other engineering departments of the Territory and the Counties. Unless some solution is found, the inevitable result appears to be either a slowing down of the Territory's public works program or inadequate engineering planning and design.

### Financing

Financing of projects is always a major consideration in any public works program. This is particularly true of the Irrigation Authority since projects constructed under the provisions of the Irrigation Act can be undertaken only when found to be economically feasible and self-supporting (unless otherwise specifically excepted by action of the

Legislature).

A total of \$5 million in bond funds has been authorized by the Legislature for the Molokai Irrigation Project. Estimated costs of the construction of the transmission and distribution system and the development of water in Waikolu Valley for this project are \$6.5 million. Additional funds in the amount of \$1.5 million will be required, either by a Territorial bond appropriation or by Congressional action to make Federal funds available.

Of the \$1.4 million authorized in bond funds for the Waimea-Lalamilo project, approximately \$800,000 has been expended or is encumbered for construction work now in progress. The balance of approximately \$600,000 is sufficient to construct a supply line and a distribution system for about 750 acres in Lalamilo. If the Hawaiian Homes Commission decides not to use any water from this irrigation system for its Puukapu lands, an additional \$300,000 to \$400,000 will be needed to expand the distribution system in Lalamilo in order to fully utilize the water available from this system.

Studies of the Kokee, Kauai and Waianae, Oahu projects are not sufficiently advanced now to determine their economic feasibilities or to make any reliable estimates of costs of construction. It is possible, although there is no assurance at this time, that funds for the construction of these projects can be obtained from Congress on a reimbursable loan basis.

The Authority's revolving fund was established for the purpose of "administrative costs, engineering surveys, economic studies, plans, maps, and for other purposes of the Authority, including irrigation projects." Expenditures from this fund which are directly attributable to specific projects are to be reimbursed to the revolving fund

from any funds received by the Authority for such projects. However, certain expenditures by the Authority are not reimbursable to the revolving fund. These include the following: (1) expenditures not attributable to specific projects; (2) expenditures for studies and surveys of projects found to be unfeasible; and (3) expenditures for projects found to be feasible but not undertaken because construction funds are not appropriated.

It will also be necessary, in most instances, to advance monies from the revolving fund to meet operating and maintenance costs for irrigation projects during the first few years after their completion, or until the project lands are sufficiently settled to produce revenues to meet such costs. An example of such a situation is the Wai-manalo irrigation system, which, it is anticipated, will not be self-supporting for possibly another two years, or until the area is fully subdivided and all of the farms are under cultivation and being irrigated.

Advances will also be made from the revolving fund for studies and investigations which will require several years before funds will finally be appropriated for the project and from which such costs can be reimbursed to the revolving fund.

For the reasons given above, the Authority's revolving fund is being diminished to the point that the irrigation program may have to be curtailed during the next biennium unless the incoming Legislature makes an appropriation to augment this fund.

In lieu of or in addition to augmenting the revolving fund, it is suggested that the revenues received by the Territory for water licenses and water permits, exclusive of the 30% of such revenues now

appropriated to the Hawaiian Homes Commission, be appropriated to the Irrigation Authority to be used for administrative costs and general territory-wide water studies and investigations not directly chargeable to specific irrigation projects. The use of money received by the Territory from its water licenses and water permits would seem to be appropriate for the purposes of the Irrigation Authority, viz., the development of water for irrigation in connection with the Territory's land utilization program and the making of studies and investigations to determine the Territory's water resources and the best means for their conservation and economical utilization.

Existing statutes permit Territorial bonds to be issued for periods not in excess of thirty years. However, the policy of the Territorial Treasurer is to sell bonds on a 20-year basis. It is not realistic to expect irrigation projects to produce sufficient revenues to amortize their construction costs within such short periods of time--either twenty years or thirty years. It takes several years to construct projects and again several more years before the project lands can be settled to the point that revenues can be expected to exceed minimum operational and maintenance costs. In the meantime interest and principal charges accumulate. This situation has already developed in the cases of the Molokai and Waimea irrigation projects where the Authority has been billed for bond costs, yet one project (Molokai) is only in the design stage and the other (Waimea) is still under construction. Revenues from these projects, in excess of their operating and maintenance costs, are at least three to five years away and the Authority has no recourse but to default on these bond charges in the meantime.

If the Authority were to establish water rates for the Molokai and

Waimea irrigation projects at levels which would assure sufficient revenues to pay the amortization charges within periods of twenty years, the irrigation charges would probably be too high for economical farming. Since irrigation projects have potential usable lives of better than fifty years, a fifty-year repayment period would appear both reasonable and practicable.

The United States Government came to this conclusion relative to its irrigation program but not until after some years of experience. In 1902, the original Reclamation Act specified a repayment period of ten years for irrigation projects. Changes in this Act were made from time to time over the course of years with the result that the Bureau of Reclamation is now authorized to construct projects with 40-year repayment periods with the right to re-execute these periods for water development costs. Congress has authorized much longer repayment plans in instances where it was not feasible for such projects to meet their repayments within forty years. The usual repayment plan, however, provides for a 10-year development period followed by a 40-year repayment period. The development period commencing with the completion of construction of the project, is to allow for settlement of the land and during this period no capital cost repayments are required. Repayment of the construction costs during the subsequent 40-year period is without interest.

In order for the Authority to furnish irrigation water to farmers at an economical rate, it is necessary that repayment be made over as long a period of years as reasonably possible.

Federal Cooperation

The Authority has entered into an agreement with the Bureau of Reclamation, Department of the Interior, to furnish technical assistance and advice in the broader aspects of project planning upon request by the Authority and upon advancing the estimated costs of such assistance to the Bureau. An outlined plan of investigation for the Kokee project on the Island of Kauai is currently being worked out under the terms of this agreement.

Under Public Law 634, passed by the 83d Congress in 1954, the Bureau of Reclamation is making a detailed feasibility report of the Molokai irrigation project. The Authority's staff has spent considerable time in working with the Bureau's engineers and the completed report is expected within a few months. The Bureau will also prepare a short report on the Waimea, Hawaii irrigation project. It was under this Law that the Special Committee of the House Territorial and Insular Affairs Committee, U. S. Congress, visited Hawaii in December 1954 to investigate water resources in the Territory.

CONDENSED FINANCIAL STATEMENT

Financial Statement - Revolving Fund  
as of February 29, 1956

	Engineering, Operational & Other Costs (Net)	Admin- istrative Overhead Costs (Net)	Total
HIA Revolving Fund			
Appropriation, A/245, SL 1953			\$500,000
Advances to Projects:			
Waimanalo (Less: Receipts of \$72,216)	\$67,105	\$11,935	\$79,040
Waimea	873	16,903	17,781
Molokai	39,010	57,466	96,476
Kula	10,754	14,495	25,249
Kokee	4,016	13,130	17,146
Waianae	3,839	9,079	12,918
Totals	<u>\$125,602</u>	<u>\$123,008</u>	<u>\$248,610</u>
Balance in Appropriation			251,390
Less: Balance Encumbered (Molokai)			<u>45,783</u>
Balance in Appropriation Unencumbered			<u>\$205,607</u>

Summary Statement of Finances  
as of February 29, 1956

	Appro- priation	Receipts	Expend- itures	Encum- brances	Balance 2/29/56
Revolving Fund:					
Act 245, SL 1953	\$500,000	\$83,800	\$332,410	\$45,783	\$205,607
Molokai Project:					
Chap. 317, RLH 1945, Bond Fund	2,500,000	---	29,954	---	2,470,046
Act 273, SL 1955, Bond Fund	2,500,000	---	---	---	2,500,000
Waimea Project:					
Act 240, SL 1951, Bond Fund	1,000,000	---	540,945	231,409	227,646
Act 273, SL 1955, Bond Fund	400,000	---	---	---	400,000

Pertinent Data of the Proposed

MOLOKAI IRRIGATION PROJECT

Location -- Island of Molokai.

Authorization -- Chapter 317, R.L.H. 1945 (Act 227, S.L.H. 1943) as amended by Acts 245, S.L.H. 1953 and Act 138, S.L.H. 1955, Act 164, S.L.H. 1955.

Project Lands -- Approximately 13,600 acres, including Hawaiian Homes Commission Hoolehua lands and Maunaloa lands.

Crops -- Pineapple and diversified crops.

Funds Available -- \$2.5 million bond authorization, Chapter 317, R.L.H. 1945; \$2.5 million bond authorization, Act 273, S.L.H. 1955. These bond funds are not available for use by the Authority until Section 221 of the Hawaiian Homes Commission Act, 1920 is amended to delete the "free water" clause. H.R. 7552 deleting Section 221 is now pending before the House, U. S. Congress.

Estimated Cost -- \$6.5 million to develop water in Waikolu Valley, and construct transmission pipelines and tunnel, and a distribution system for Hoolehua.

Water development -- Estimated minimum of 12-million gallons per day available to meet maximum irrigation requirements.

Possible Future Extension -- The tunnel can be extended from Waikolu to Pelekunu and Wailau Valleys, which, with development tunnels, will produce an additional 20 to 30 million gallons per day at a cost of \$6 to \$7 million.

Present Status -- Tunnel to Waikolu Valley and transmission pipelines and the distribution system now being designed. The Bureau of Reclamation is now reviewing the project and preparing a feasibility report for the Secretary of the Interior under Public Law 634.

Federal Aid -- If report by Bureau is favorable Federal financing in the form of a reimbursable loan may be possible (probably interest-free or partially interest-free).

Comments -- This project appears to be a sound undertaking for the Territory. If financed through Territorial bond funds with repayment over a 40-year period following a 10-year development period, the average cost per acre for water will be between \$25 and \$30 per year. If financed by Federal funds without charges for interest, the costs would be reduced by about \$5 per acre per year.

Pertinent Data of the Proposed

WAIMEA IRRIGATION PROJECT

Location -- Island of Hawaii.

Authorization -- Act 240, S.L.H. 1951 as amended by Act 245, S.L.H. 1953 and Act 138, S.L.H. 1955.  
Act 273, S.L.H. 1955

Project Lands -- Approximately 1500 acres in Lalamilo and Hawaiian Homes Commission Puukapu lands.

Crops -- Diversified.

Estimated Cost -- \$1,400,000.

Funds Available -- \$1.0 million bond authorization, Act 240, S.L.H. 1951; \$400,000 bond authorization, Act 273, S.L.H. 1955.

Water Development -- Water for this project will be obtained from the Upper Hamakua Ditch system which collects surface water from the Kohala forest reserve watershed.

Possible Future Expansion -- If irrigation water is not used by Hawaiian Homes Commission, the project may be extended to serve additional acreage in Lalamilo.

Present Status -- A 24" concrete pipe supply line which connects the Upper Hamakua Ditch to a 60-million gallon reservoir has recently been completed. The 60-million gallon reservoir is now under construction and should be completed within the next few months. Pipelines from the reservoir to the Hawaiian Homes Commission lands were completed in 1951-52. The Authority is now designing an extension of the transmission line from the end of the existing pipeline in Puukapu to Lalamilo, and a reservoir in Lalamilo.

Comments -- Although several inquiries have been made of the Hawaiian Homes Commission regarding their water requirements for this project, the Authority has not as yet received a definite commitment. If the Hawaiian Homes Commission

decides not to take any of this irrigation water, all of the water will be made available to the Territory's Lalamilo farm lots, except for a small amount which may be applied for by the present farmers in Kamuela.

The estimated cost of constructing this project, \$1,400,000, is based on an irrigation system supplying water to 750 acres of Hawaiian Homes Commission land plus 750 acres in Lalamilo. If the Hawaiian Homes Commission decides not to take water, the Lalamilo system will be expanded to supply water to approximately 1500 acres. This will require an additional expenditure of \$300,000 to \$400,000.

Pertinent Data of the  
WAIMANALO IRRIGATION SYSTEM

Location -- Waimanalo, Oahu.

Authorization -- Request from Territorial Commissioner of Public Lands to carry out purposes of Joint Resolution No. 8, 27th Legislature (1953).

Project Lands -- Gross area of 2805 acres of land which reverted to the Territory with the expiration of General Lease No. 2543 on November 21, 1953. Area to be developed as irrigated farm lands estimated to be 1200 to 1250 acres.

Estimated Cost -- This system is now in operation. Such improvements as will be made will not be extensive and it is believed they can be financed through advancing money from the Authority's revolving fund.

Water Development -- Water presently being obtained from tunnels in Maunawili Valley at a purchase price of \$8000 per year from Kaneohe Ranch Co., Ltd. There is a possibility of developing Kailua Swamp water for this irrigation system but the economics of this proposal have not been fully determined.

Possible Future Expansion -- Limitations on available land and water resources make future expansion of the system improbable.

Present Status -- This area has been partly subdivided and roads, domestic water system, and realignment of certain irrigation ditches are now under construction. Approximately 28 lots, totaling about 246.2 acres have been sold in fee by the Territory to resident farmers qualifying under the Bankhead-Jones Farm Tenant Act. During the period since this land was returned to the Territory, only part of the area has been under cultivation requiring irrigation with the result that only part of the water available from the irrigation system has been utilized. Because of this situation, revenues from the sale of water have been low and not sufficient to meet operating and maintenance costs. It is believed, however, that when the proposed farm lot area of approximately 1200 acres is subdivided and sold that this irrigation system can operate on a self-supporting basis.

This irrigation system is an old plantation open ditch

type, including many old wooden flumes, which is expensive to operate. Charges for irrigation water supplied by this system are necessarily on the high side and it is not thought that these rates can be increased appreciably without hardship to the farmers. Accordingly, it appears unlikely that losses now being incurred in the operation of this system can be made up through surplus revenues collected in future years although it is believed that this system will eventually reach a satisfactory "breakeven" operating point.

Period November 22, 1953 through February, 29, 1956

<u>Revenues Received from Sale of Water</u>	<u>Operating and Maintenance Costs</u>	Deficit (Advanced from the <u>Revolving Fund</u> )
\$77,114.00	\$124,520.00	\$47,406.00

Pertinent Data of the Proposed

WAIANAЕ IRRIGATION PROJECT

Location -- Waianae District, Oahu.

Authorization -- House Concurrent Resolution No. 42, 28th Legislature (1955) and in accordance with the provisions of Act 245, S.L.H. 1953 as amended.

Project Lands -- Include a total of approximately 2000 acres located in Nanakuli (Hawaiian Homes Commission), Mikilua, Lualualei, and Waianae Valleys.

Crops -- Diversified.

Estimated Cost -- \$2,000,000.

Funds Available -- No construction funds. Advances from the Authority's revolving fund being made for studies and investigations.

Water Development -- Water resources very limited in this area. Various schemes being investigated.

Present Status -- The proposed plan is being studied preliminarily at the present time. Detailed studies will be undertaken as soon as preliminary data is evaluated.

Comments -- Two plans of development have been considered for Waianae. The first is to develop water locally and limit the size of the irrigation project to the amount of water that can be provided. The second plan would be to bring water from Pearl Harbor Springs on a joint undertaking with the U.S. Navy, the Suburban Water System and possibly the Campbell Estate and Ewa Plantation. This plan is more complicated, expensive, and might run into difficult water rights problems.

Pertinent Data of the Proposed

KOKEE IRRIGATION PROJECT

Location -- Island of Kauai.

Authorization -- Joint Resolution No. 11, 28th Legislature (1955) and Act 245, S.L.H. 1953, as amended.

Project Lands -- Approximately 3000 acres of Hawaiian Homes Commission lands. Water will also be supplied to Territorial and Hawaiian Homes Commission lands now under lease to the Kekaha Plantation.

Crops -- Diversified and sugar cane.

Estimated Cost -- No estimate now available.

Fund Available -- Investigation studies being financed through advance of monies from the Authority's revolving fund. No construction funds available.

Water Development -- Impounding dams to store the stream flows of Waiakoali and Kawaikoi Streams.

Present Status -- Only preliminary studies have been completed. When the report from the Bureau of Reclamation is received, detailed field investigations will be undertaken. This project is a sizeable undertaking and may include hydro-electric power development and flood control in addition to irrigation. Extensive field investigations are required for sound planning of this project.

Pertinent Data of the Proposed

KULA IRRIGATION PROJECT

Location -- Kula, Maui.

Authorization -- House Concurrent Resolution No. 42, Twenty-eighth Legislature (1955) and in accordance with the provisions of Act 245, S.L.H. 1953 as amended.

Project Lands -- Area to be irrigated is dependent upon the amount of water to be developed.

Crops -- Diversified.

Estimated Cost -- Not available at this time.

Funds Available -- Investigation studies being financed through advance of monies from the Authority's revolving fund. No construction funds available.

Water Development -- Very limited water resources available.

Present Status -- Investigations of this project have been about completed. Data being evaluated. Preliminary conclusions indicate this project to be not economically feasible.

LEGISLATION DIRECTLY AFFECTING THE  
HAWAII IRRIGATION AUTHORITY  
ENACTED BY THE 28th LEGISLATURE -- 1955

Acts

- Act 138 (Senate Bill 556) amends the Irrigation Act (Act 245, S.L.H. 1953) to clarify certain language, to provide greater flexibility in operations and to more clearly set forth the functions and procedures of the Authority.
- Act 164 (House Bill 1106) allocates the water developed on Molokai by the Irrigation Authority on a basis of 2/3rds to the Hawaiian Homes Commission lands and 1/3rd to other lands.
- Act 273 (Senate Bill 758) appropriates funds from bond authorizations for expenditure by the Hawaii Irrigation Authority as follows:
- \$2,500,000 -- Molokai irrigation system.
- \$ 400,000 -- Waimea irrigation project, extension of project to Lalamilo lands.

Joint Resolutions Requiring Congressional Action

- J.R. 10 (H.J.R. 96) memorializes Congress to permit the Hawaiian Homes Commission to grant the Authority easements and rights of way for pipelines, reservoir sites, etc.
- (Introduced in Congress as part of H R 7552 on July 25, 1955, now pending in the House.)
- J.R. 17 (H.J.R. 83) memorializes Congress to rescind the "free water" section in the Hawaiian Homes Commission Act of 1920 with reference to Molokai.
- (Introduced in Congress as part of H R 7552 on July 25, 1955, now pending in the House.)
- J.R. 19 (H.J.R. 153) memorializes Congress to amend the Hawaiian Organic Act relative to the inclusion of Territorial lands in an irrigation project.
- (As H R 6461, passed by Congress and signed by the President on April 6, 1956.)

Joint Resolutions Not Requiring Congressional Action

- J.R. 7 (S.J.R. 89) provides for the inclusion of all citizen employees of the Waimanalo irrigation system in the Civil Service of the Territory.

J.R. 11 (H.J.R. 34) directs the Authority to make studies of the Kokee project on Kauai.

Concurrent Resolutions Passed by the Legislature

H.C.R. 45 requests the Authority to make studies of an irrigation project for the Waianae District on Oahu.

H.C.R. 42 requests the Authority to make studies of an irrigation project for the Kula area on Maui.

Date: \_\_\_\_\_

*Gaylord*   
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