

Report to the Twenty-Seventh Legislature
Regular Session of 2013

**THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM
State Fiscal Year 2012**



Prepared by the
Department of Land and Natural Resources
State of Hawaii

In response to
Section 179D-29, Hawaii Revised Statutes

October 2012

THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM

State Fiscal Year 2012

This report is prepared pursuant to Section 179D-29, Hawaii Revised Statutes (HRS), and covers the period July 1, 2011 through June 30, 2012.

INTRODUCTION

The Department of Land and Natural Resources (Department), Engineering Division administers the “Hawaii Dam and Reservoir Safety Act of 2007”, Chapter 179D (Dam and Reservoir Safety Program), HRS. This Act, in conjunction with Chapter 13-190.1, Hawaii Administrative Rules (HAR), “Dams and Reservoirs”, governs the design, construction, operation, maintenance, enlargement, alteration, repair, and removal of dams, reservoirs, and their appurtenant works in the State of Hawaii, to protect the health, safety, and welfare of the citizens of the State by reducing the risk of failure of the dams or reservoirs. Pursuant to Section 179D-29, HRS, the Department of Land and Natural Resources (Department) shall submit an annual report to the Governor and the Legislature by January 5 of each year concerning the activities of the Department relating to this chapter for the preceding fiscal year (FY). The report shall include but not be limited to information on the following:

- (1) Approvals of plans and specifications for the construction of dams and reservoirs and for alterations, modifications, repairs, removal, and enlargements of any dams and reservoirs;
- (2) A listing of dam and reservoir safety inspections made;
- (3) Use of appropriated funds;
- (4) Rules adopted or amended;
- (5) Enforcement orders and proceedings;
- (6) Dam and reservoir failures and department evaluations of the reasons for the failure, if known; and
- (7) Any other available data regarding the effectiveness of the State's Dam and Reservoir Safety Program.

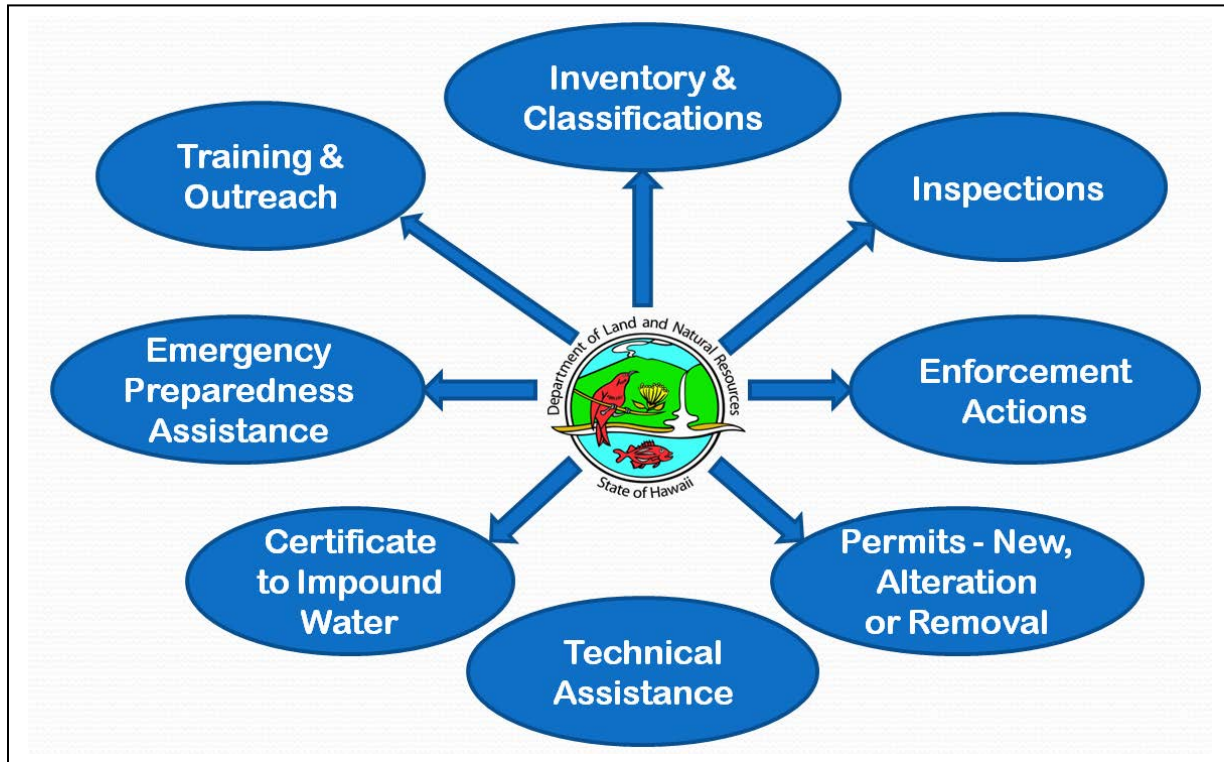
BACKGROUND

Historically, dams and reservoirs in Hawaii were predominately developed by the agriculture industry in the early 1900s. Today, dams and reservoirs continue to be used by the agriculture industry, in addition to providing storage for drinking water, flood control, hydro electric, recreation and other purposes.

Only dams that meet a certain jurisdictional size criteria (height and volume) are regulated by the Department. Regulated dams are identified as having artificial barriers which are 25-feet or more in height or have an impounding capacity of 50-acre-feet (~17 million gallons) or more. Dams less than 6-feet in height, regardless of storage capacity, or that have a storage capacity not in excess of 15-acre-feet (5 million gallons) regardless of height do not fall under State of Hawaii jurisdiction, unless otherwise specified by the Dam and Reservoir Safety Program.

THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM

There are several core functions that make up the Dam and Reservoir Safety Program:



Regulated Dam Inventory and Dam Classifications: The Department maintains a database of regulated structures, including classifications of each in regards to size, hazard potential and condition. The condition classification is a relatively new field which the Dam and Reservoir Safety Program is working to consistently apply across the State based on the condition assessments conducted on all regulated dams.

Dam Safety Inspections: The Department staff routinely inspects regulated structures statewide and occasionally retains consultants to confirm or provide additional assessments. The Department currently inspects dams on a two year frequency, and is reevaluating this frequency as it updates the existing hazard classifications for all the regulated dams statewide.

Enforcement Actions: The Hawaii Dam and Reservoir Safety Act of 2007 authorized the Department to take enforcement action for both emergencies and any other violations of the act. The Department is establishing administrative enforcement action procedures that are initiated by the following general deficiencies:

- Failure of dam and reservoir owners to comply with general requirements and responsibilities.
- Non-compliance with dam safety permit general terms and special conditions
- Non-compliance with certificate to impound terms and conditions

The Department did not proceed with enforcement actions against any dam owner in Fiscal Year 2012.

Dam Safety Construction Permits: A permit from the Board of Land and Natural Resources (Board) is required for all dam construction, alteration, enlargement, modifications or removal work. Dams are uniquely engineered structures that require knowledge and experience in dam safety, particularly on how to safely handle water flows in and out of the structure as well as water passing through the dam embankment itself. Dams are often under-sustained hydrostatic water loads, which if not properly designed can rapidly result in a failure of the dam. Dam safety permits allow the Department to review and check proposed improvements for concurrence with current dam safety practices and guidelines. Work that is not considered routine maintenance will require prior approval from the Board. Detailed procedures and requirements for this permitting process are provided in Chapter 13-190.1, HAR, which recently became effective. The Department also has additional guidance documents for dam owners and designers and as well as a standard set of general permit requirements.

Certificate of Approval to Impound: The certificate of approval to impound water requirement was included in the Hawaii Dam and Reservoir Safety Act of 2007. Issuance of this certificate will be dependent on dam and reservoir owners ensuring their structures are remedied of critical deficiencies and meet minimum operational criteria. The Department has developed guidelines and procedures for this certificate and has spent much of the last year in discussions with dam owners on the implementation of this new requirement. The Department plans to initiate this process in the upcoming fiscal year.

Emergency Preparedness: The Department assists in providing technical assistance to dam owners and emergency management officials and agencies both prior to dam safety emergencies and during critical events. The Department developed guidelines and emergency action plan templates for owners to utilize in formulating and executing a plan of action should a possible threat occur on the dam facilities.

Training and Outreach: The Department provides technical assistance to the dam owners, operators and consultants, as well as to the broader community of hazard mitigation partners and agencies. The Department works closely with the Association of State Dam Safety Officials, (ASDSO) to collaborate on public outreach and national awareness of the importance of dam safety programs.

FUNDING

The Department’s Dam and Reservoir Safety Program is funded under the State LNR 810 Program, Prevention of Natural Disasters, and receives operational funding from two state special funds and a federal grant from the United States Department of Homeland Security, Federal Emergency Management Agency (FEMA). The following is a breakdown of incoming funds to the department for its dam safety activities in FY 2012:

<u>Source</u>	<u>Approximate Funding</u>
State of Hawaii – Special Land and Development Fund	\$ 463,100
State of Hawaii – Dam and Reservoir Safety Special Fund (Previous FY carry over and \$26,658 in revenue from permit application fees)	\$ 625,800
FEMA – National Dam Safety Program Grant (FY 2011-2012)	\$ 58,000
Total Available Funding	\$ 1,146,900

Expenditures from the various funding sources were made as follows:

	Operating Special Fund	Act 118 SLH 2006	Dam and Reservoir Safety Special Fund	Federal Funds	Total
Personnel Services	\$ 379,900	\$ 0	\$ 0	\$ 0	\$ 379,900
Contract Services	\$ 0	\$ 234,970	\$ 4,500	\$ 36,770	\$ 276,240
Travel (Inspection costs)	\$ 28,050	\$ 0	\$ 0	\$ 11,770	\$ 39,820
Other Expenses (Supplies, Operating & Equipment)	\$ 29,590	\$ 0	\$ 0	\$ 12,400	\$ 41,990
B&F Management Fee	\$ 7,770	\$ 0	\$ 1,980	\$ 0	\$ 9,750
Totals	\$ 445,310	\$ 234,970	\$ 6,480	\$ 60,940	\$ 747,700

Expenditures for personnel and other operational expenses reflect reductions due to the 5% temporary salary cut and increases for fringe surcharge on special funded positions. Funding for the State Land and Natural Resources 810 Program supports multiple programs which include the State oversight of the National Flood Insurance Program, the State General Flood Control Plan and the Dam Safety Program. An attempt was made to isolate the dam safety portion of the allocation and expenditures in the above figures, however some overlap in expenditures between these programs are unavoidable. Most of the operating special funds were expended on salaries. Other major expenditures were for consultant contracts and travel. Travel expenses were incurred mainly from neighbor island inspections costs, and also include the costs for out-of-state training of dam safety personnel.

Not all of the federal funds awarded to the State were expended. An extension on the grant performance period was granted by FEMA for the State to retain a consultant to conduct training and prepare an operation and maintenance manual for dam owners to utilize. An operation and maintenance manual is required by Chapter 179D, HRS, for all dam owners.

The Dam and Reservoir Safety Special Fund was intended to maintain a funding reserve should there be a dam safety emergency. Unfortunately, due to the economic conditions, the targeted \$700,000 emergency reserve was not attainable and only approximately \$ 550,000 was retained. In order to maintain this emergency reserve, the Dam and Reservoir Safety Program was able to minimize expenses to this fund in FY 2011 by postponing some contracts into the early part of FY 2012. The Hawaii Dam and Reservoir Safety Act of 2007 initially allocated \$2,000,000 to the Department's Dam and Reservoir Safety Program, however only \$1,000,000 was released to the Department. The Program has also been sustaining operations from ongoing consultant services contracts that were funded under appropriation for Act 118, Session Laws of Hawaii 2006, which provided a one-time emergency relief. With the new administrative rules becoming effective, the Department anticipates being able to proceed with planned dam safety activities while still retaining an emergency reserve base in this fund.

DAM SAFETY ACTIVITIES:

- A. Approvals of plans and specifications for the construction of dam and reservoirs and for alterations, modifications, repairs, removals, and enlargements of any dams and reservoirs;

During FY 2012, six (6) new permit applications were received and eight (8) dam safety alteration permits were issued.

Dam Safety Permit Applications Received:

Dam Name	Description of Improvements	County	Cost Estimate
Paauilo Reservoir	Relocate Outlet works control upstream	Hawaii	\$ 345,100
Napili 4-5 Desilting Basin	Install Upstream Control Gates and Screen	Maui	\$ 21,500
Opaeula Reservoir No. 2	Dam removal	Oahu	\$ 802,100
Pauwela Reservoir	Install Upstream Control	Maui	\$ 56,300
Maunaolu Reservoir	Drainage improvements	Honolulu	\$ 199,500
Oahu Reservoir 545A Removal	Dam Removal	Honolulu	\$ 664,200
Oahu Reservoir 530 Removal	Dam Removal	Honolulu	\$ 1,310,300
Oahu Reservoir 510 Removal	Dam Removal	Honolulu	\$ 811,900

Dam Safety Permits Issued:

Dam Name	Description of Improvements	County	Permit Date
Aahoaka Reservoir	Spillway, outlet works and embankment modifications	Kauai	07/01/11
Paauilo Reservoir	Outlet works upstream control, vegetation	Hawaii	07/08/11
Wahikuli Reservoir	Dam removal	Maui	07/21/11
Napili 4-5 Desilting Basin	Install Upstream Control Gates and Screen	Maui	08/22/11
Kolea Reservoir	Dam removal	Maui	9/2/2011
Opaeula Reservoir No. 2	Dam removal	Oahu	09/09/11
Kehena Reservoir	Removal of dam from regulation	Hawaii	11/4/2011
Hanamaulu Field 21	Dam removal	Kauai	11/10/2011

Additionally, the Department assisted many dam and reservoir owners in the review of preliminary designs, proposed work, and monitoring of ongoing permit construction activity. Below is a listing of active permits in FY 2012 and their current status.

Dam Name	Description of Improvements	County	Construction Status
Kehalani Retention Basin	New Construction	Maui	Under Construction
Opaeula Reservoir No. 1	Dam Improvements	Oahu	Under Construction
Upper Kapahi Reservoir	Gate and Catwalk - DOA	Kauai	Under Construction
Upper Kapahi Reservoir	New spillway and embankment modifications	Kauai	Under Construction
Wailua Reservoir	Spillway and embankment modifications	Kauai	Under Construction
Upper Kapahi Reservoir	New spillway and embankment modifications	Kauai	Under Construction
Helemano 11	Dam removal	Oahu	Completed
Hanamaulu Field 21	Dam removal	Kauai	Under Construction
Wailua Reservoir	Spillway and embankment modifications	Kauai	Under Construction
Wahikuli Reservoir	Dam removal	Maui	Under Construction
Kolea Reservoir	Dam removal	Maui	Pending Federal Permits; Construction Awarded
Hawi 3 Reservoir	Reducing size to under regulatory limit. Revising spillway and embankment.	Hawaii	Completed
Aahoaka Reservoir	Spillway, outlet works and embankment modifications	Kauai	Under Construction, pending possible redesign
Waimea 60 MG Reservoir (Puukapu)	Reservoir Lining, Outlet works modifications and Monitoring wells.	Hawaii	Permit in review process; Construction Contract Awarded
Paauilo Reservoir	Outlet works upstream control, vegetation removal	Hawaii	Under Construction
Puu Pulehu Reservoir	Embankment buttress w/ subdrain, and spillway improvements	Hawaii	Permit in review process; Construction Contract Awarded
Kehena Reservoir	Removal of dam from regulation	Hawaii	Completed

B. A listing of dam and reservoir safety inspections:

In FY 2012, The Dam and Reservoir Safety Program staff conducted 56 visual dam safety inspections on regulated dams. In addition to these inspections, the department also inspected 19 unregulated dams and conducted 77 inspections to monitor construction activity and storm follow-up related inspections. Listings of the 56 visual dam safety inspections are provided below:

Dams in Hawaii County

State ID	Dam Name	Inspection	Date of
HA-0040	Waikoloa Reservoir No 1	Visual Dam Safety / Earthquake	November 1, 2011
HA-0042	Waimea 60 MG Reservoir	Visual Dam Safety / Earthquake	November 2, 2011
HA-0122	Waikoloa Reservoir No 2	Visual Dam Safety / Earthquake	November 1, 2011
HA-0123	Puu Pulehu Reservoir	Visual Dam Safety / Earthquake	November 2, 2011
HA-0131	Paauiilo Reservoir	Visual Dam Safety / Earthquake	November 2, 2011
HA-0136	Waikoloa Reservoir No 3	Visual Dam Safety / Earthquake	November 1, 2011
HA-0147	Punawai Reservoir	Visual Dam Safety / Earthquake	November 1, 2011

Dams in Maui County

State ID	Dam Name	Inspection	Date of
MA-0057	Kahoma Reservoir	Visual Dam Safety	August 12, 2011
MA-0068	HC&S Reservoir 14	Visual Dam Safety	July 13, 2011
MA-0069	HC&S Reservoir 15	Visual Dam Safety	July 13, 2011
MA-0071	HC&S Reservoir 21	Visual Dam Safety	July 13, 2011
MA-0073	HC&S Reservoir 24	Visual Dam Safety	July 12, 2011
MA-0074	HC&S Reservoir 25	Visual Dam Safety	July 13, 2011
MA-0080	HC&S Reservoir 60	Visual Dam Safety	July 12, 2011
MA-0081	HC&S Reservoir 61	Visual Dam Safety	July 12, 2011
MA-0097	Kolea Reservoir	Visual Dam Safety	December 6, 2011
MA-0140	Ukumehame Reservoirs	Visual Dam Safety	August 12, 2011
MA-0141	Kehalani Offsite Basin	Visual Dam Safety	August 12, 2011
MO-0041	Kualapuu Reservoir	Visual Dam Safety	July 27, 2011

Dams in Kauai County

State ID	Dam Name	Inspection	Date of
KA-0002	Puu Lua Reservoir	Visual Dam Safety	May 2, 2012
KA-0003	Puu Opaie Reservoir	Visual Dam Safety	November 9, 2011
KA-0004	Kitano Reservoir	Visual Dam Safety	May 2, 2012
KA-0005	Mana Reservoir	Visual Dam Safety	May 2, 2012
KA-0006	Waikaia Reservoir	Visual Dam Safety	February 23, 2012
KA-0007	Kepani Reservoir	Visual Dam Safety	February 23, 2012

State ID	Dam Name	Inspection	Date of
KA-0008	Waikoloa Reservoir	Visual Dam Safety	February 23, 2012
KA-0009	Kaawanui Reservoir	Visual Dam Safety	February 23, 2012
KA-0010	Waiakalua Reservoir	Visual Dam Safety	July 26, 2011
KA-0011	Aii Reservoir	Visual Dam Safety	April 24, 2012
KA-0012	Kapaia Reservoir	Visual Dam Safety	April 25, 2012
KA-0014	Okinawa Reservoir	Visual Dam Safety	April 25, 2012
KA-0015	Kaneha Reservoir	Visual Dam Safety	April 16, 2012
KA-0016	Mimino Reservoir	Visual Dam Safety	April 16, 2012
KA-0024	Kalihiwai Reservoir	Visual Dam Safety	May 1, 2012
KA-0030	Kaloko Reservoir	Visual Dam Safety	February 8, 2012
KA-0044	Ahukini Reservoir	Visual Dam Safety	April 25, 2012
KA-0062	Twin Reservoir	Visual Dam Safety	July 26, 2011
KA-0064	Field 2 Kealia Reservoir	Visual Dam Safety	March 14, 2012
KA-0065	Upper Anahola Reservoir	Visual Dam Safety	March 14, 2012
KA-0066	Lower Anahola Reservoir	Visual Dam Safety	March 14, 2012
KA-0067	Field 1 Kealia Reservoir	Visual Dam Safety	March 14, 2012
KA-0099	Waita Reservoir	Visual Dam Safety	April 24, 2012
KA-0100	Kapa Reservoir	Visual Dam Safety	March 1, 2012
KA-0105	Elima Reservoir	Visual Dam Safety	February 28, 2012
KA-0107	Puu O Hewa Reservoir	Visual Dam Safety	March 28, 2012
KA-0109	Ipuolono Reservoir	Visual Dam Safety	March 1, 2012
KA-0115	Pia Mill Reservoir	Visual Dam Safety	March 28, 2012
KA-0115	Pia Mill Reservoir	Visual Dam Safety	June 13, 2012
KA-0116	Mau Reservoir	Visual Dam Safety	February 28, 2012
KA-0117	Elua Reservoir	Visual Dam Safety	February 28, 2012
KA-0117	Mauka Reservoir	Visual Dam Safety	June 13, 2012
KA-0118	Manuhonuhonu Reservoir	Visual Dam Safety	May 1, 2012
KA-0119	Mauka Reservoir	Visual Dam Safety	March 28, 2012
KA-0120	Papuaa Reservoir	Visual Dam Safety	April 24, 2012
KA-0121	Halenanahu Reservoir	Visual Dam Safety	April 24, 2012
KA-1107	Puu O Hewa Reservoir	Visual Dam Safety	June 13, 2012

C. Rules adopted or amended;

Chapter 190.1, HAR, that was adopted by the Board of Land and Natural Resources in November 2010, and became effective on February 20, 2012.

D. Enforcement orders and proceedings;

The Dam and Reservoir Safety Program did not have any enforcement activities in FY 2012.

E. Dam and reservoir failures and department evaluations of the reasons for the failure, if known;

There were no known dam failures or incidents in FY 2012.

F. Other available data regarding the effectiveness of the State's Dam and Reservoir Safety Program.

The Program is working with dam owners to complete Emergency Action Plans (EAP) for their facilities. EAPs are required by statute for only high and significant hazard potential classifications of dams. Out of the 139 regulated dams in FY 2012, 133 are classified as high or significant hazard potential structures. The following is a summary of EAPs on file with the Department for all classifications.

Number of Dams with EAPs				
FY 2004	FY 2007	FY 2010	FY 2011	FY 2012
12	55	121	118	125