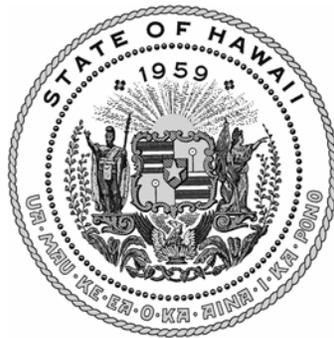


Report to the Twenty-Eighth Legislature  
2015 Regular Session

**REPORT ON  
THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM  
STATE FISCAL YEAR 2014**



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

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

October 2014

## **REPORT ON THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM STATE FISCAL YEAR 2014**

This report is prepared pursuant to Hawaii Revised Statutes (HRS) Section 179D-29, and covers the period from July 1, 2013 through June 30, 2014.

### **INTRODUCTION**

The Department of Land and Natural Resources (Department), Engineering Division administers the “Hawaii Dam and Reservoir Safety Act of 2007”, HRS Chapter 179D (Dam Safety Program). This Act, in conjunction with Hawaii Administrative Rules (HAR) Chapter 13-190.1, “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 HRS Section 179D-29, the 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. 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.

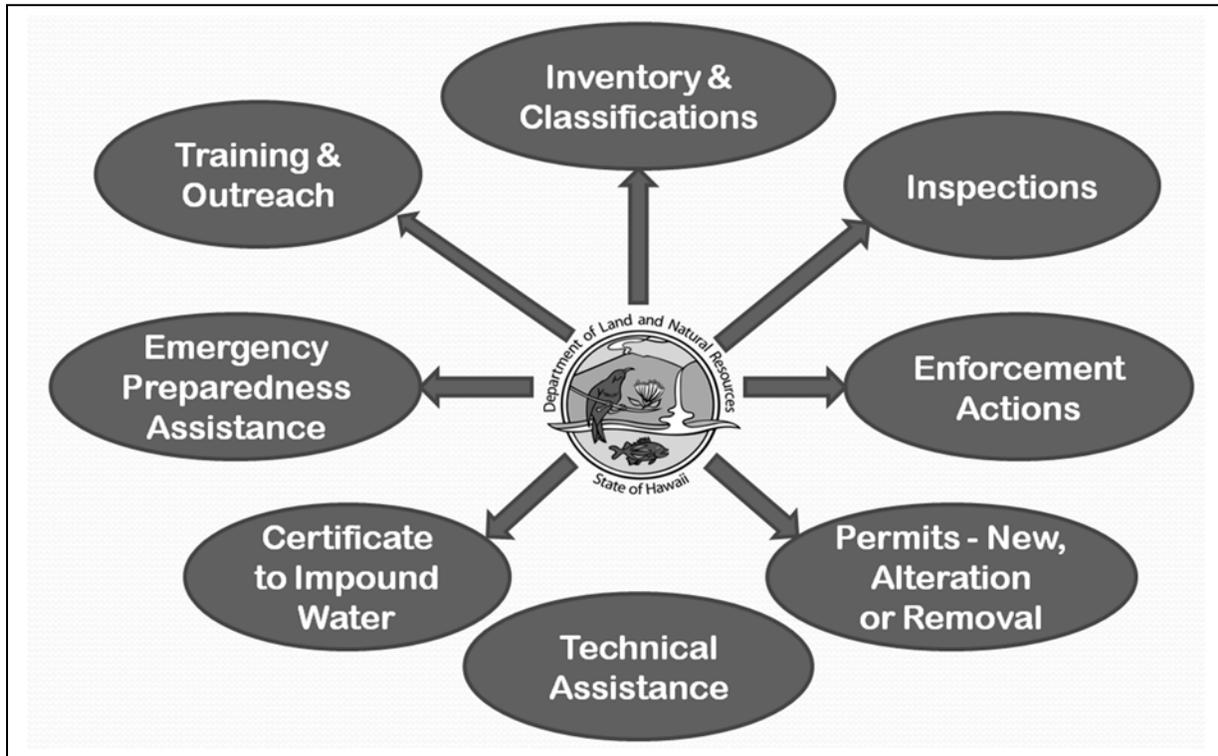
### **BACKGROUND**

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 Hawaii Dam and Reservoir Safety Program.

## THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM

There are several core functions that make up the Hawaii 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 overall condition. The Department verified and updated their inventory of regulated structures in 2006 and verified the size classification. Hazard potential classifications were updated and assigned by the department as a product of their statewide dam break modeling analysis conducted between 2007 and 2011. The overall condition assessment classification is a relatively new field which the Hawaii Dam and Reservoir Safety Program is working to consistently apply across the state based on the condition assessments conducted on all regulated dams. All regulated dams were assessed and assigned an overall condition assessment classification during phase I inspections conducted statewide in 2007-2009.

**Dam Safety Inspections:** The Department staff routinely inspects regulated structures statewide and retains consultants as necessary, 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. The Department also conducts construction or other informal inspections that are in addition to these visual dam safety inspections.

**Enforcement Actions:** The Hawaii Dam and Reservoir Safety Act of 2007 (HRS Chapter 179D) authorizes the Department to take enforcement action for both emergencies and any other violations of the Act. The Department has established 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 issue some penalty fines for delinquent submissions, however did not proceed with enforcement actions against any dam owner in Fiscal Year (FY) 2014 (See Section D)

**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 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 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 requires prior approval from the Board. Detailed procedures and requirements for this permitting process are provided in HAR Chapter 190.1. The Department also has developed additional guidance documents for dam owners and designers as well as a standard set of general permit requirements.

**Certificate of Approval to Impound:** The Certificate of Approval to Impound (CAI) 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 in coordination with dam owners on the implementation of this new requirement. The Department sent out notices to complete and submit CAI applications, to all owners of regulated dams and reservoirs in the state in FY 2014. The Department received CAI applications for most of the regulated structures and are in the process of reviewing these submissions.

**Emergency Preparedness:** HRS Chapter 179D, requires that all dam owners of High and Significant Hazard Potential Dams complete and submit an Emergency Action Plan (EAP) to the Department. The Department developed guidelines and an EAP template for dam owners to utilize in formulating and executing a plan of action should a possible threat or deficiency occur on their dam facilities. The Department provides training and technical assistance to dam owners and emergency management officials to assist them in the completion and execution of the EAPs. Additionally, the Department is identified as a technical advisor during dam safety emergencies where an EAP is activated.

**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 Hawaii Dam and Reservoir Safety Program is funded under the State Land and Natural Resources LNR 810 Program, Prevention of Natural Disasters, and receives operational funding from two state special funds and one 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 2014:

<u>Source</u>	<u>Approximate Funding</u>
State of Hawaii – Special Land and Development Fund	\$ 422,060
State of Hawaii – Dam and Reservoir Safety Special Fund (Previous FY carry over)	\$ 666,430
Annual Dam Safety Fees (Outstanding FY13 & FY14)	\$ 558,320
Application Fees & Other Revenues (including fines)	\$ 64,620
<u>FEMA – National Dam Safety Program Grant (Federal FY 2013)</u>	<u>\$ 57,538</u>
<b>Total Available Funding</b>	<b>\$ 1,768,968</b>

Expenditures from the various funding sources were made as follows:

	Operating Special Fund	Dam and Reservoir Safety Special Fund	Federal Funds	Total
Personnel Services	\$380,900	\$0	\$0	\$380,900
Consultant Services	\$0	\$21,920	\$0	\$21,920
Inspections Costs (including travel)	\$20,120	\$5,320	\$0	\$25,440
Training Expense (including travel)	\$0	\$0	\$7480	\$7,480
Other Expenses (Supplies, Operating & Equipment)	\$11,080	\$9,270	\$38,980	\$59,330
B&F Management Fee	\$8,810	\$33,830	\$0	\$42,640
	\$420,910	\$70,340	\$46,460	\$537,710

Funding for the State LNR 810 Program supports multiple programs which include the State oversight of the National Flood Insurance Program, the State General Flood Control Plan and the Hawaii Dam and Reservoir 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.

The Dam and Reservoir Safety Special Fund was intended to maintain a funding reserve should there be a dam safety emergency. 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. With the new HAR becoming effective at the end of FY 2012, the Department was able to start collecting Dam Safety annual fees from regulated dam owners. The collection of these fees has enabled the Department to meet the targeted \$700,000 minimum emergency reserve. The Department is starting on several contracts to start installing remote water level gages to enable the Department to better monitor and assess regulated dams and reservoirs remotely.

**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 2014, two (2) new permit applications were received for which two (2) dam safety alteration permits were issued.

**Dam Safety Permits Issued:**

<b>Dam Name</b>	<b>Description of Improvements</b>	<b>County</b>	<b>Permit Date</b>
Morita Reservoir	Removal of Dam	Kauai	April 15, 2014
Ahukini Reservoir	Dam Removal	Kauai	April 10, 2014

Additionally, the Department assisted many dam and reservoir owners in the review of preliminary designs, proposed work, and monitoring of ongoing permit construction activity. The following is a listing of active permits in FY 2014 and their current status.

<b>Dam Name</b>	<b>Description of Improvements</b>	<b>County</b>	<b>Permit Status</b>
Kehalani Retention Basin	New Construction	Maui	Under Construction
Kolea Reservoir	Dam Removal	Maui	Completed
Opaeula Reservoir No. 2	Dam Removal	Oahu	Completed
Opaeula Reservoir No. 1	Dam Improvements	Oahu	Completed

Hanamaulu Field 21	Dam Removal	Kauai	Completed
Aahoaka Reservoir	Spillway, Outlet Works and Embankment Modifications	Kauai	Construction Suspended Scope being revised by Owner
<b>Dam Name</b>	<b>Description of Improvements</b>	<b>County</b>	<b>Permit Status</b>
Upper Kapahi Reservoir	Outlet Gate and Catwalk Repairs	Kauai	Construction Suspended
Upper Kapahi Reservoir	New Spillway and Embankment Modifications	Kauai	Construction Suspended
Wailua Reservoir	Outlet Gate and Catwalk Repairs	Kauai	Completed
Wailua Reservoir	Spillway and Embankment Modifications	Kauai	Completed
Paauilo Reservoir	Outlet Works Upstream Control, Vegetation	Hawaii	Pending Construction Start
Waimea 60 MG Reservoir (Puukapu)	Reservoir Lining, Outlet Works Modifications and Monitoring Wells.	Hawaii	Pending Construction Start
Puu Pulehu Reservoir	Embankment buttress w/ subdrain, and spillway improvements	Hawaii	Application in review process; Construction Contract Awarded
Maunaolu Reservoir	Spillway Improvements	Honolulu	Completed
Oahu Reservoir 545A Removal	Dam Removal	Honolulu	Completed
Oahu Reservoir 530 Removal	Dam Removal	Honolulu	Completed
Oahu Reservoir 510 Removal	Dam Removal	Honolulu	Completed
Morita Reservoir	Removal of Dam from Inventory	Kauai	Completed
Ahukini Reservoir	Dam Removal	Kauai	Pending Construction Start

B. A listing of dam and reservoir safety inspections;

In FY 2014, the Hawaii Dam and Reservoir Safety Program staff conducted 55 visual dam safety inspections on regulated dams. In addition to these inspections, the department also conducted 39 informal dam safety inspection visits (including 4 Outlet Works Video Inspections) and conducted 20 inspections to monitor construction activity. Listings of the 55 visual dam safety inspections are provided below:

Dams in Honolulu County

State ID	Dam Name	Type of Inspection	Date
OA-0018	Opaeula 01 Reservoir	Visual Dam Safety	10-Oct-13
OA-0020	Opaeula 15 Reservoir	Visual Dam Safety	10-Oct-13
OA-0129	Waimanalo 60 MG Reservoir	Visual Dam Safety	24-Oct-13

Dams in Maui County

State ID	Dam Name	Type of Inspection	Date
MA-0041	Kualapuu Reservoir	Visual Dam Safety	9-Jul-13
MA-0057	Kahoma Reservoir	Visual Dam Safety	25-Jul-13
MA-0068	HC&S Reservoir 14	Visual Dam Safety	31-Jul-13
MA-0069	HC&S Reservoir 15	Visual Dam Safety	31-Jul-13
MA-0069	HC&S Reservoir 15	Visual Dam Safety	16-Oct-13
MA-0071	HC&S Reservoir 21	Visual Dam Safety	31-Jul-13
MA-0073	HC&S Reservoir 24	Visual Dam Safety	30-Jul-13
MA-0074	HC&S Reservoir 25	Visual Dam Safety	31-Jul-13
MA-0080	HC&S Reservoir 60	Visual Dam Safety	30-Jul-13
MA-0081	HC&S Reservoir 61	Visual Dam Safety	30-Jul-13
MA-0125	Happy Valley Flood Prevention	Visual Dam Safety	16-Oct-13
MA-0140	Ukumehame Reservoirs	Visual Dam Safety	25-Jul-13
MA-0150	Wailuku Water Reservoir 6	Visual Dam Safety	25-Jul-13
MA-0152	Wakamoi Reservoirs	Visual Dam Safety	20-Aug-13

Dams in Hawaii County

State ID	Dam Name	Type of Inspection	Date
HA-0040	Waikalua Reservoir No 1	Visual Dam Safety	29-Oct-13
HA-0042	Waimea 60 MG Reservoir	Visual Dam Safety	12-Feb-14
HA-0049	Keaiwa Reservoir	Visual Dam Safety	10-Apr-14
HA-0122	Waikalua Reservoir No 2	Visual Dam Safety	29-Oct-13
HA-0123	Puu Pulehu Reservoir	Visual Dam Safety	12-Feb-14
HA-0131	Paauilo Reservoir	Visual Dam Safety	12-Feb-14
HA-0136	Waikalua Reservoir No 3	Visual Dam Safety	29-Oct-13
HA-0147	Punawai Reservoir	Visual Dam Safety	3-Apr-14

Dams in Kauai County

State ID	Dam Name	Type of Inspection	Date
KA-0002	Puu Lua Reservoir	Visual Dam Safety	14-May-14
KA-0003	Puu Opae Reservoir	Visual Dam Safety	5-Dec-13
KA-0004	Kitano Reservoir	Visual Dam Safety	14-May-14
KA-0005	Mana Reservoir	Visual Dam Safety	11-Sep-13
KA-0006	Waikaia Reservoir	Visual Dam Safety	20-Feb-14
KA-0007	Kepani Reservoir	Visual Dam Safety	20-Feb-14
KA-0008	Waikoloi Reservoir	Visual Dam Safety	20-Feb-14
KA-0009	Kaawanui Reservoir	Visual Dam Safety	20-Feb-14
KA-0011	Aii Reservoir	Visual Dam Safety	30-Apr-14
KA-0012	Kapaia Reservoir	Visual Dam Safety	30-Apr-14
KA-0014	Okinawa Reservoir	Visual Dam Safety	30-Apr-14
KA-0015	Kaneha Reservoir	Visual Dam Safety	9-Apr-14
KA-0016	Mimino Reservoir	Visual Dam Safety	9-Apr-14
KA-0024	Kalihiwai Reservoir	Visual Dam Safety	16-Apr-14
KA-0030	Kaloko Reservoir	Visual Dam Safety	16-Apr-14
KA-0060	Wailua Reservoir	Visual Dam Safety	13-Mar-14
KA-0061	Twin Reservoir	Visual Dam Safety	18-Sep-13
KA-0064	Field 2 Kaelia Reservoir	Visual Dam Safety	8-May-14
KA-0065	Upper Anahola Reservoir	Visual Dam Safety	8-May-14
KA-0066	Lower Anahola Reservoir	Visual Dam Safety	8-May-14
KA-0067	Field 1 Kaelia Reservoir	Visual Dam Safety	8-May-14
KA-0099	Waita Reservoir	Visual Dam Safety	1-May-14
KA-0100	Kapa Reservoir	Visual Dam Safety	23-Apr-14
KA-0105	Elima Reservoir	Visual Dam Safety	26-Feb-13
KA-0109	Ipuolono Reservoir	Visual Dam Safety	23-Apr-14
KA-0116	Mau Reservoir	Visual Dam Safety	26-Feb-13
KA-0117	Elua Reservoir	Visual Dam Safety	26-Feb-13
KA-0118	Manuhonuhonu Reservoir	Visual Dam Safety	4-Jun-14
KA-0120	Papuaa Reservoir	Visual Dam Safety	1-May-14
KA-0121	Halenanahu Reservoir	Visual Dam Safety	1-May-14

C. Rules adopted or amended;

No rules were adopted or amended.

D. Enforcement orders and proceedings;

The Department did issue some penalty fines for delinquent submissions to the dam owner of the following dams in FY 2014:

KA-10 Waiakalua Reservoir (Delinquent Annual Fee)

The Dam Safety Program did not have any enforcement activities in FY 2014.

E.

F. 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 2014.

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

The Dam Safety 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 132 regulated dams in FY 2014, 121 are classified as high or significant hazard potential structures. The following is a summary of EAPs on file with the Department for all classifications. Note that the number decreased from last year because several dams that had EAPs were removed from the inventory.

Number of Dams with EAPs					
FY 2004	FY 2007	FY 2010	FY 2012	FY 2013	FY 2014
12	55	121	125	130	127