

Report to the Twenty-Seventh Legislature  
Regular Session of 2014

**THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM  
STATE FISCAL YEAR 2013**



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

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

November 2013

## **THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM STATE FISCAL YEAR 2013**

This report is prepared pursuant to Section 179D-29, Hawaii Revised Statutes (HRS), and covers the period July 1, 2012 through June 30, 2013.

### **INTRODUCTION**

The Department of Land and Natural Resources (Department), Engineering Division administers the “Hawaii Dam and Reservoir Safety Act of 2007”, Chapter 179D (Dams and Reservoirs), HRS. 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 Section 179D-29, HRS, 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.

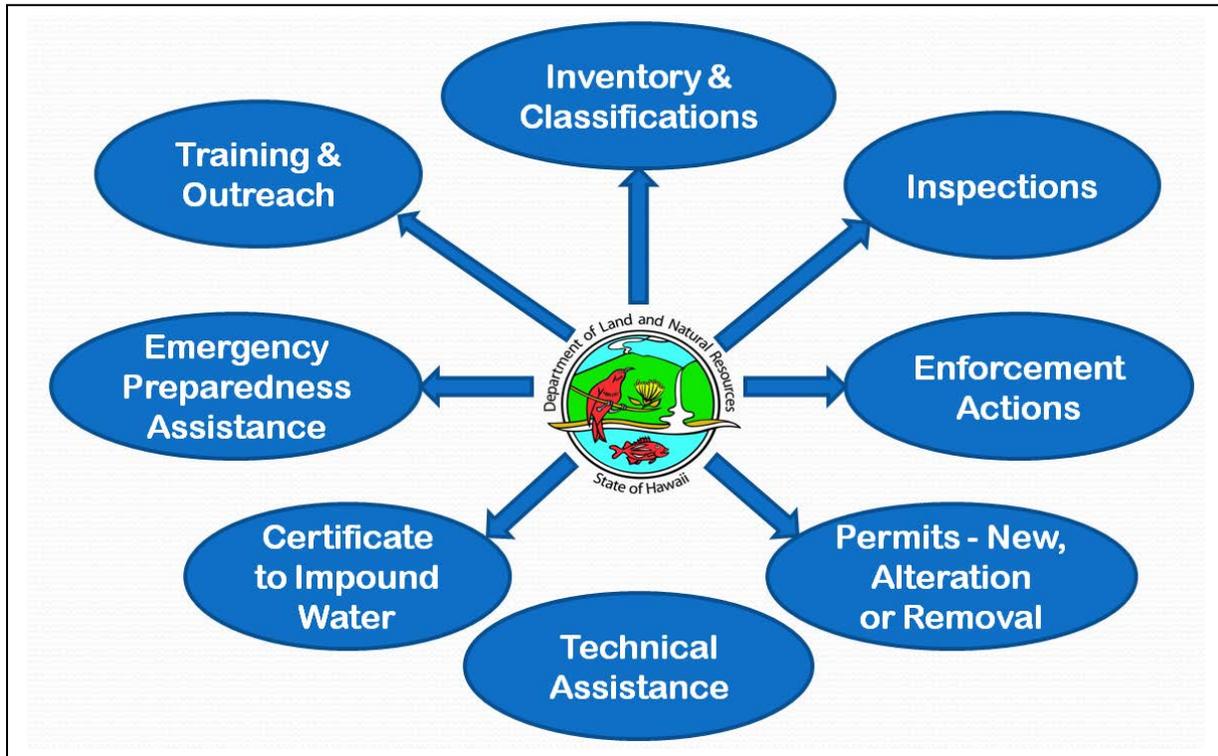
### **BACKGROUND**

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 authorized 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) 2013 (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 construction 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 Chapter 190.1, HAR. 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 2013. The Department received CAI applications for most of the regulated structures and will review these submissions in FY 2014.

**Emergency Preparedness:** Chapter 179D, HRS, 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 Dam 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 2013:

<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)	\$ 359,820
Annual Dam Safety Fees (Partial FY’12 & FY’ 13)	\$ 886,082
Permit Fees & Misc. Charges	\$ 48,012
FEMA – National Dam Safety Program Grant (FY 2011-2012)	\$ 56,396
<b>Total Available Funding</b>	<b>\$ 1,772,370</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	\$36,840	\$0	\$36,840
Travel (Inspection costs)	\$16,600	\$1,230	\$2,410	\$20,240
Other Expenses (Supplies, Operating & Equipment)	\$5,620	\$19,900	\$52,710	\$78,230
B&F Management Fee	\$16,320	\$49,500	\$0	\$65,820
	<b>\$419,440</b>	<b>\$107,470</b>	<b>\$55,120</b>	<b>\$582,030</b>

Funding for the State LNR 810 Program supports multiple programs which include 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 emergency reserve and start on several contracts to enable the Department to better monitor and assess regulated dams and reservoirs.

**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 2013, no new permit applications were received and five (5) 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>
Maunaolu Reservoir	Spillway Improvements	Honolulu	November 14, 2012
Waimea 60 MG Reservoir (Puukapu)	Reservoir Lining, Outlet works modifications and Monitoring wells.	Hawaii	October 29, 2012
Oahu Reservoir 545A Removal	Dam Removal	Honolulu	September 14, 2012
Oahu Reservoir 530 Removal	Dam Removal	Honolulu	September 14, 2012
Oahu Reservoir 510 Removal	Dam Removal	Honolulu	September 14, 2012

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 2013 and their current status.

<b>Dam Name</b>	<b>Description of Improvements</b>	<b>County</b>	<b>Construction Status</b>
Kehalani Retention Basin	New Construction	Maui	Under Construction
Wahikuli Reservoir	Dam removal	Maui	Completed
Napili 4-5 Desilting Basin	Install Upstream Control Gates and Screen	Maui	Completed
Kolea Reservoir	Dam removal	Maui	Pending Construction Start
Opaeula Reservoir No. 2	Dam removal	Oahu	Under Construction
Opaeula Reservoir No. 1	Dam Improvements	Oahu	Under Construction
Hanamaulu Field 21	Dam removal	Kauai	Completed, pending final closeout / first filling
Aahoaka Reservoir	Spillway, outlet works and embankment modifications	Kauai	Plans modified by owner, DLNR reviewing revised plan
Upper Kapahi Reservoir	Gate and Catwalk - DOA	Kauai	Construction Terminated
Upper Kapahi Reservoir	New spillway and embankment modifications	Kauai	Construction Terminated
Wailua Reservoir	Spillway and embankment modifications	Kauai	Completed, pending final closeout / first filling
Paaulo 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	Permit in review process; Construction Contract Awarded

B. A listing of dam and reservoir safety inspections;

In FY 2013, The Hawaii Dam and Reservoir Safety Program staff conducted 73 visual dam safety inspections on regulated dams and five Phase I inspections on currently unregulated dams to determine if they meet the regulatory height and volume criteria. In addition to these inspections, the Department also conducted 28 informal dam safety inspection visits and conducted 43 inspections to monitor construction activity. Listings of the 78 visual dam safety inspections (including the five Phase I inspections) are provided below:

Dams in Honolulu County

State ID	Dam Name	Inspection	Date of
OA-0001	Nuuanu Dam No. 4	Visual Dam Safety	August 14, 2012
OA-0001	Nuuanu Dam No. 4	Visual Dam Safety	October 26, 2012
OA-0017	Wahiawa Dam	Visual Dam Safety	March 6, 2013
OA-0021	Kemoo 5 Reservoir	Visual Dam Safety	March 6, 2013
OA-0022	Upper Helemano Reservoir	Visual Dam Safety	March 7, 2013
OA-0023	Helemano 6 Reservoir	Visual Dam Safety	March 7, 2013
OA-0045	Helemano 16 Reservoir	Visual Dam Safety	March 7, 2013
OA-0124	Kaneohe Dam	Visual Dam Safety	November 16, 2012
OA-0137	Oahu Reservoir 155	Visual Dam Safety	November 7, 2012

Dams in Maui County

State ID	Dam Name	Inspection	Date of
MA-0046	Waikamoi Dam No 2	Visual Dam Safety	January 9, 2013
MA-0047	Piiholo Reservoir	Visual Dam Safety	February 13, 2013
MA-0048	Olinda Reservoir	Visual Dam Safety	January 9, 2013
MA-0054	Horner Reservoir	Visual Dam Safety	January 16, 2013
MA-0056	Hanakaoo Reservoir	Visual Dam Safety	January 16, 2013
MA-0058	Honokowai Reservoir	Visual Dam Safety	February 21, 2013
MA-0059	Reservoir 140	Visual Dam Safety	February 21, 2013
MA-0070	HC&S Reservoir 20	Visual Dam Safety	June 19, 2013
MA-0072	HC&S Reservoir 22	Visual Dam Safety	June 19, 2013
MA-0075	HC&S Reservoir 30	Visual Dam Safety	June 19, 2013
MA-0076	HC&S Reservoir 33	Visual Dam Safety	June 18, 2013
MA-0077	HC&S Reservoir 40	Visual Dam Safety	June 18, 2013
MA-0078	HC&S Reservoir 42	Visual Dam Safety	June 18, 2013
MA-0079	HC&S Reservoir 52	Visual Dam Safety	April 30, 2013
MA-0082	HC&S Reservoir 70	Visual Dam Safety	March 19, 2013
MA-0083	HC&S Reservoir 73	Visual Dam Safety	March 19, 2013
MA-0084	HC&S Reservoir 74	Visual Dam Safety	March 19, 2013
MA-0085	HC&S Reservoir 80	Visual Dam Safety	April 30, 2013

Dams in Maui County (Continued)

State ID	Dam Name	Inspection	Date of
MA-0086	HC&S Reservoir 81	Visual Dam Safety	April 30, 2013
MA-0087	HC&S Reservoir 82	Visual Dam Safety	April 30, 2013
MA-0088	HC&S Reservoir 84	Visual Dam Safety	April 30, 2013
MA-0089	HC&S Reservoir 90	Visual Dam Safety	March 19, 2013
MA-0090	HC&S Reservoir 92	Visual Dam Safety	March 19, 2013
MA-0091	Peahi Reservoir	Visual Dam Safety	April 18, 2013
MA-0092	Papaaea Reservoir	Visual Dam Safety	April 18, 2013
MA-0093	Kaupakulua Reservoir	Visual Dam Safety	February 27, 2013
MA-0094	Kapalaalaea Reservoir	Visual Dam Safety	April 18, 2013
MA-0095	Haiku Reservoir	Visual Dam Safety	February 27, 2013
MA-0096	Pauwela Reservoir	Visual Dam Safety	February 27, 2013
MA-0126	Kahana Nui Dam	Visual Dam Safety	December 12, 2012
MA-0127	Napili 4-5 Desilting Basin	Visual Dam Safety	December 12, 2012
MA-0128	Napili 2-3 Desilting Basin	Visual Dam Safety	December 12, 2012
MA-0130	Honokowai Structure #8	Visual Dam Safety	December 12, 2012
MA-0132	Upper Field 14 Reservoir	Visual Dam Safety	February 21, 2013
MA-0133	Puu Koa Reservoir	Visual Dam Safety	February 20, 2013
MA-0134	Kaopala Basin	Visual Dam Safety	December 12, 2012
MA-0138	Kahakapao Reservoirs	Visual Dam Safety	January 9, 2013
MA-0139	Maui Field 290 Reservoir	Visual Dam Safety	February 20, 2013
MA-0141	Kehalani Offsite Retention Basin	Visual Dam Safety	June 12, 2013
MA-0142	Middle Field 14 Reservoir	Visual Dam Safety	February 21, 2013
MA-0143	Kaili Ili Reservoir	Visual Dam Safety	February 20, 2013
MA-0144	Mahinahina Reservoir	Visual Dam Safety	January 16, 2013
MA-0151	Wailuku Water Reservoir 10	Visual Dam Safety	June 12, 2013

Dams in Hawaii County

State ID	Dam Name	Inspection	Date of
HA-0043	Puukapu Watershed Dam R-1	Visual Dam Safety	November 29, 2012
HA-0049	Keaiwa Reservoir	Visual Dam Safety	November 1, 2012
HA-0051	Hawi No. 5 Reservoir	Visual Dam Safety	November 29, 2012

### Dams in Kauai County

State ID	Dam Name	Inspection	Date of
KA-0010	Waiakalua Reservoir	Visual Dam Safety	May 8, 2013
KA-0013	Upper Kapahi Reservoir	Visual Dam Safety / Construction	September 4, 2012
KA-0061	Lower Kapahi Reservoir	Visual Dam Safety	August 21, 2012
KA-0063	Aahoaka Reservoir	Visual Dam Safety	December 5, 2012
KA-0098	Alexander	Visual Dam Safety	May 30, 2013
KA-0101	Hukiwai Reservoir	Visual Dam Safety	April 3, 2013
KA-0102	Ioleau Reservoir	Visual Dam Safety	April 3, 2013
KA-0103	Aepo Reservoir	Visual Dam Safety	October 3, 2012
KA-0104	Huinawai Reservoir	Visual Dam Safety	October 3, 2012
KA-0106	Kumano Reservoir	Visual Dam Safety	October 17, 2012
KA-0108	Kaupale Reservoir	Visual Dam Safety	October 30, 2012
KA-0110	Aepoalua Reservoir	Visual Dam Safety	October 3, 2012
KA-0111	Aepoekolu Reservoir	Visual Dam Safety	October 17, 2012
KA-0112	Aepoeha Reservoir	Visual Dam Safety	October 17, 2012
KA-0113	Omao Reservoir	Visual Dam Safety	October 30, 2012
KA-0114	Piwai Reservoir	Visual Dam Safety	October 30, 2012
KA-0145	Kauai Lagoons	Visual Dam Safety	May 15, 2013
KA-0146	Halaula Reservoir	Visual Dam Safety	May 15, 2013

### Phase I Dam Safety Inspections (Regulatory Determination Pending)

Island	Dam Name	Inspection	Date of
Kauai	Hanini Reservoir	Phase I Inspection	June 26, 2013
Kauai	Pond No. 1 at Kauai Ranch	Phase I Inspection	June 26, 2013
Maui	Plantation Reservoir	Phase I Inspection	June 25, 2013
Maui	HC&S Reservoir 32	Phase I Inspection	June 25, 2013
Oahu	Nuuanu Reservoir No. 1	Phase I Inspection	June 27, 2013

#### 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 2013:

- KA-10 Waiakalua Reservoir (Delinquent Annual Fee)
- KA-30 Kaloko Reservoir (Delinquent Annual Fee)
- KA -62 Twin Reservoir (Delinquent Annual Fee)
- OA-25 Ku Tree Reservoir (Delinquent Annual Fee)

The Hawaii Dam and Reservoir Safety Program did not have any enforcement activities in FY 2013.

- 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 2013.

- F. Other available data regarding the effectiveness of the Hawaii Dam and Reservoir Safety Program.

The Hawaii Dam and Reservoir 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 138 regulated dams in FY 2013, 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	FY 2013
12	55	121	118	125	130

The Hawaii Dam and Reservoir Safety Program also conducted four outreach training seminars on Oahu, Kauai, Maui and Hawaii to train owners and operators on dam safety inspection, operation and maintenance of their facilities. Along with the training, attendees were provided with a CD containing a guidance document to aid them in developing their own operation and maintenance manuals for their facilities along with a sample template document. Operation and Maintenance Manuals are an owner responsibility stipulated in Chapter 179D, HRS. Attendance numbers at each of the seminars are:

Oahu: 56  
 Hawaii: 23  
 Maui: 32  
 Kauai: 35