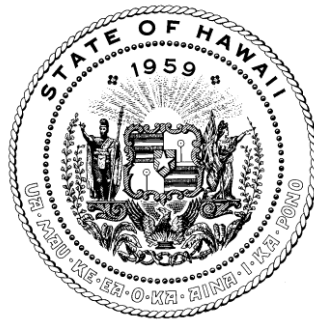


Report to the Twenty-Sixth Legislature
Regular Session of 2012

State Fiscal Year 2011
REPORT ON THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM



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

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

November 2011

State Fiscal Year 2011
REPORT ON THE HAWAII DAM AND RESERVOIR SAFETY PROGRAM

This report is prepared pursuant to Section 179D-29, Hawaii Revised Statutes (HRS), and covers the period July 1, 2010 through June 30, 2011.

INTRODUCTION

The Department of Land and Natural Resources (Department), Engineering Division administers the “Hawaii Dam and Reservoir Safety Act of 2007”, Chapter 179D (Program), HRS. This Act, in conjunction with Chapter 13-190, “Dams and Reservoirs”, Hawaii Administrative Rules (HAR), 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.

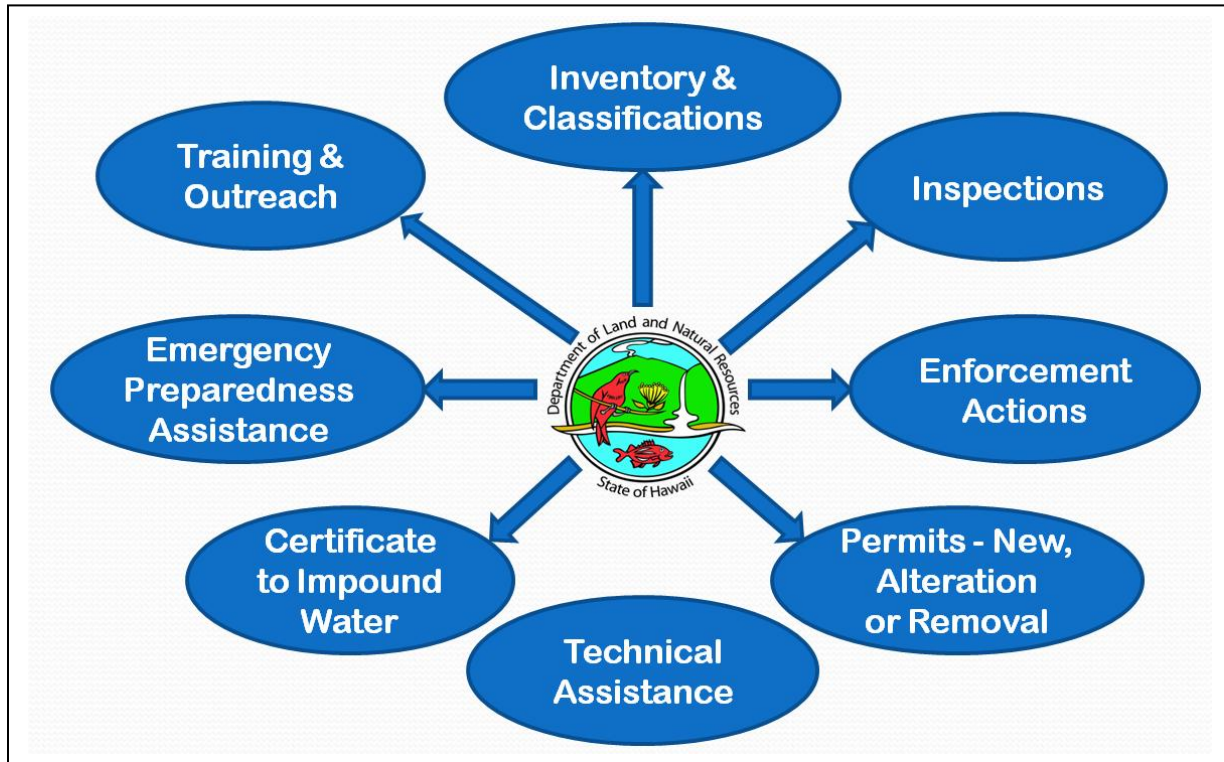
BACKGROUND

Historically, dams and reservoirs in Hawaii were predominately developed by the agriculture industry. 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 size (height and volume) criteria 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 Program.

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 condition. The condition classification is a new field which the Program is working on developing and obtaining necessary information to complete.

Dam Safety Inspections: The Department routinely inspects regulated structures statewide. The existing administrative rules specify a minimum inspection frequency of not less than once every 5 years. The Department currently inspects dams on a bi-annual frequency for higher hazard structures, 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 enforcement action procedures that are initiated by the following:

- Failure to remedy deficiencies identified during routine inspections
- Non-compliance with dam safety permit general terms and special conditions
- Non-compliance with certificate to impound terms and conditions
- Non-compliance with owner responsibilities (Section 179D-30, HRS)
- Failure to remedy deficiencies identified by the Department

The Department did not proceed with enforcement actions against any dam owners in Fiscal Year (FY) 2011.

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 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. The Department has interim guidelines for minimum permit requirements and is working to finalize these guideline updates soon. The guidelines provide additional clarifications to the permit requirements in the draft dam safety administrative rules.

Certificate of Approval to Impound: A certificate of approval to impound water was included in the Hawaii Dam and Reservoir Safety Act of 2007. Issuance of this certificate will be dependent on owners ensuring their structures are remedied of critical deficiencies and meet minimum operational criteria. The Department is currently developing guidelines and procedures for this certificate and did not issue out any certificates of approval to impound in FY 2011. The Department has been working with dam owners to coordinate and educate them on this new certificate requirement.

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 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 Federal Emergency Management Agency (FEMA). The following is a breakdown of incoming funds to the department for its dam safety activities in FY 2011:

<u>Source</u>	<u>Approximate Funding</u>
State of Hawaii – Special Land and Development Fund	\$ 463,146
State of Hawaii – Dam and Reservoir Safety Special Fund (includes carry over)	\$ 639,899
FEMA – National Dam Safety Program Grant (FY 2010-2011)	\$ 57,032
Total Available Funding	\$ 1,160,077

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	\$372,000	\$0	\$0	\$0	\$372,000
Consultant Services	\$20,800	\$151,670	\$47,410	\$0	\$219,880
Travel (Inspection costs)	\$14,170	\$0	\$0	\$7,760	\$21,930
Other Expenses (Supplies, Operating & Equipment)	\$18,170	\$0	\$0	\$2,380	\$20,550
B&F Management Fee	\$0	\$0	\$2,840	\$0	\$2,840
Totals	\$425,140	\$151,670	\$50,250	\$10,140	\$637,200

Expenditures for personnel and other operational expenses reflect reductions due to furloughs and other spending restrictions imposed due to the tough economic conditions. 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 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 prepare a recommended operation and maintenance manual for dam owners to utilize. An operation and

maintenance manual is required by Chapter 179D, HRS, for all owners of high and significant hazard dams.

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 maintained. This balance is projected to drop down to \$230,000 in FY 2012, which is insufficient to be able to fund one round of dam safety inspection statewide let alone provide any funds for remediation efforts. The Hawaii Dam and Reservoir Safety Act of 2007 initially allocated \$2,000,000 to the Department's Dam Safety Program, however only \$1,000,000 was released to the Department. Further complicating the budget is that the Program has been sustaining operations from ongoing consultant services contracts that were funded from the emergency relief Act 118, Session Laws of Hawaii 2006. It is anticipated that the Program will require approximately \$ 1.5 million to cover payroll and other operational expenditures. This will not be possible unless additional funding is provided by the Legislature or administrative rules approved by the Governor which will allow the Department to collect annual and permit fees.

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 2011, thirteen (13) new permit applications were received and eight (8) dam safety alteration permits were issued.

Dam Safety Permit Applications Received:

Dam Name	Description of Improvements	City	Estimated Construction Costs
Upper Kapahi Reservoir	New spillway and embankment modifications	Kauai	\$5,630,000
Helemano 11	Dam removal	Oahu	\$165,000
Hanamaulu Field 21	Dam removal	Kauai	\$408,000
Wailua Reservoir	Spillway and embankment modifications	Kauai	\$2,140,000
Wahikuli Reservoir	Dam removal	Maui	\$455,400
Kolea Reservoir	Dam removal	Maui	\$699,997
Hawi 3 Reservoir	Reducing size to under regulatory limit. Revising spillway and embankment.	Hawaii	\$1,330,800
Aahoaka Reservoir	Spillway, outlet works and embankment modifications	Kauai	\$1,845,000
Waimea 60 MG Reservoir (Puukapu)	Reservoir lining, outlet works modifications and monitoring wells.	Hawaii	\$345,000
Paauiilo Reservoir	Outlet works upstream control, vegetation	Hawaii	\$345,000
Puu Pulehu Reservoir	Embankment buttress w/ sub-drain, and spillway improvements	Hawaii	\$345,000
Puu Lua Reservoir	New spillway and embankment modifications	Kauai	\$5,000,000
Kehena Reservoir	Removal of dam from regulation	Hawaii	To be determined

Dam Safety Permits Issued:

Dam Name	Description of Improvements	City	Estimated Construction Costs
Upper Kapahi Reservoir	New spillway and embankment modifications	Kauai	\$5,630,000
Helemano 11	Dam removal	Oahu	\$165,000
Wailua Reservoir	Spillway and embankment modifications	Kauai	\$2,140,000
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Kolea Reservoir	Dam removal	Maui	\$699,997
Hawi 3 Reservoir	Reducing size to under regulatory limit. Revising spillway and embankment.	Hawaii	\$1,330,800
Aahoaka Reservoir	Spillway, outlet works and embankment modifications	Kauai	\$1,845,000
Paauilo Reservoir	Outlet works upstream control, vegetation	Hawaii	\$345,000

Additionally, the Department assisted many owners in the review of preliminary designs proposed work, and monitoring of ongoing permit applications and construction. Below is a listing of permits under construction and their current status.

Dam Name	Description of Improvements	City	Construction Status
Kehalani Retention Basin	New construction	Maui	Under construction
Puu Ka Ele Reservoir	Dam removal	Kauai	Completed
Waikoloa Reservoir No. 2	Reservoir remediation	Hawaii	Completed
Opaeha Reservoir No. 1	Dam embankment, spillway and outlet Improvements	Oahu	Completed
Upper Kapahi Reservoir	Gate and catwalk – Department of Agriculture (DOA)	Kauai	Under construction
Wailua Reservoir	Gate and catwalk - DOA	Kauai	Completed
Upper Kapahi Reservoir	Spillway and embankment modifications	Kauai	Under construction
Helemano 11	Dam removal	Oahu	Completed
Wailua Reservoir	Spillway and embankment modifications	Kauai	Under construction
Hawi 3 Reservoir	Reducing size to under regulatory limit. Spillway and embankment modifications	Hawaii	Under construction

B. A listing of dam and reservoir safety inspections made;

In FY 2011 Department staff conducted 101 visual dam safety inspections. See Appendix A for a detailed listing of dams inspected.

Additionally, the Department conducted numerous informal dam site visits and construction inspections of both regulated and some non-regulated structures.

C. Rules adopted or amended;

During the 2007 Legislative Session, the Legislature totally revised Chapter 179D, HRS, in an act entitled the Hawaii Dam and Reservoir Safety Act of 2007.

Section 179D-9, HRS, directs the Department to adopt the necessary administrative rules not later than one and one half year after July 1, 2007. Due to the total revamping of Chapter 179D, HRS, and the numerous changes, additions and deletions to the existing administrative rules necessary to implement the new requirements, penalties and fees allowed under Chapter 179D, HRS, it was determined that Chapter 13-190, HAR, be repealed and that the proposed Chapter 13-190.1, HRS, be adopted. The chronological sequences of the Department's actions in updating these administrative rules are as follows:

February 2010, Department sent a copy of these draft rules to all owners of regulated dams for their initial review and comments.

July 2010, Department received Board approval to proceed with public hearings.

August 2010, Department presented the draft rules to the State Small Business Regulatory Review Board and received approval for public hearings.

October 2010, Department conducted 4 public hearings on the islands of Hawaii, Maui, Oahu and Kauai.

November 2010, Department received Board approval to adopt draft HAR with amendments and adoption of incentive plan for dam and reservoir owners who remediate their structures soon.

January 2011, Department requests governor's approval of draft HAR with amendments. Approval pending.

March 2011- Present, Department working with the Department of Agriculture, state dam and reservoir owners and the Hawaii Farm Bureau on the details of the proposed draft HAR and implementation of new requirements of Chapter 179D, HRS.

The draft HAR are presented in appendix along with a summary of comments received during the October public hearings.

D. Enforcement orders and proceedings;

The Dam Safety Program did not have any enforcement activities in FY 2011.

- 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 2011.

- 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 136 regulated dams in FY 2011, 127 are classified as high or significant hazard potential structures. The following is a summary of EAPs on file with the Department for all classifications. The number has been reduced since FY 2010 as two dams were removed from the inventory and some EAPs have not been updated into the Department template format.

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

Appendix A
Dam Safety Inspections in FY 2011

Hawaii County Dams

State ID	Dam Name	Type of Inspection	Date of Inspection
HA-0042	Waimea 60 MG Reservoir	Visual Dam Safety	October 22, 2010
HA-0043	Puukapu Watershed Dam R-1	Visual Dam Safety	October 25, 2010
HA-0049	Keaiwa Reservoir	Visual Dam Safety	August 13, 2010
HA-0050	Hawi No. 3 Reservoir	Visual Dam Safety	December 1, 2010
HA-0051	Hawi No. 5 Reservoir	Visual Dam Safety	December 1, 2010
HA-0052	Kehena Reservoir	Visual Dam Safety	November 30, 2010
HA-0123	Puu Pulehu Reservoir	Visual Dam Safety	October 22, 2010
HA-0131	Paaulo Reservoir	Visual Dam Safety	October 25, 2010

Maui County Dams

State ID	Dam Name	Type of Inspection	Date of Inspection
MA-0046	Waikamoi Dam No. 2	Visual Dam Safety	April 26, 2011
MA-0047	Piiholo 50 MG Reservoir	Visual Dam Safety	May 17, 2011
MA-0048	Olinda Reservoir	Visual Dam Safety	April 26, 2011
MA-0054	Horner Reservoir	Visual Dam Safety	March 31, 2011
MA-0056	Hanakao Reservoir	Visual Dam Safety	March 31, 2011
MA-0058	Honokowai Reservoir	Visual Dam Safety	May 10, 2011
MA-0059	Reservoir 140	Visual Dam Safety	May 10, 2011
MA-0070	HC&S Reservoir 20	Visual Dam Safety	June 14, 2011
MA-0072	HC&S Reservoir 22	Visual Dam Safety	June 14, 2011
MA-0075	HC&S Reservoir 30	Visual Dam Safety	June 14, 2011
MA-0076	HC&S Reservoir 33	Visual Dam Safety	June 15, 2011
MA-0077	HC&S Reservoir 40	Visual Dam Safety	June 15, 2011
MA-0078	HC&S Reservoir 42	Visual Dam Safety	June 15, 2011
MA-0079	HC&S Reservoir 52	Visual Dam Safety	June 28, 2011
MA-0082	HC&S Reservoir 70	Visual Dam Safety	June 6, 2011
MA-0083	HC&S Reservoir 73	Visual Dam Safety	June 7, 2011
MA-0084	HC&S Reservoir 74	Visual Dam Safety	June 7, 2011
MA-0085	HC&S Reservoir 80	Visual Dam Safety	June 27, 2011
MA-0086	HC&S Reservoir 81	Visual Dam Safety	June 27, 2011
MA-0087	HC&S Reservoir 82	Visual Dam Safety	June 27, 2011
MA-0088	HC&S Reservoir 84	Visual Dam Safety	June 28, 2011
MA-0089	HC&S Reservoir 90	Visual Dam Safety	June 6, 2011
MA-0090	HC&S Reservoir 92	Visual Dam Safety	June 6, 2011
MA-0091	Peahi Reservoir	Visual Dam Safety	May 18, 2011
MA-0092	Papaaea Reservoir	Visual Dam Safety	May 17, 2011
MA-0093	Kaupakulua Reservoir	Visual Dam Safety	May 18, 2011
MA-0094	Kapalaalaea Reservoir	Visual Dam Safety	May 17, 2011
MA-0095	Haiku Reservoir	Visual Dam Safety	May 18, 2011
MA-0096	Pauwela Reservoir	Visual Dam Safety	May 18, 2011
MA-0126	Kahana Nui Dam	Visual Dam Safety	March 30, 2011
MA-0127	Napili 4-5 Desilting Basin	Visual Dam Safety	March 30, 2011
MA-0128	Napili 2-3 Desilting Basin	Visual Dam Safety	March 30, 2011
MA-0130	Honokowai Structure #8	Visual Dam Safety	March 30, 2011
MA-0132	Upper Field 14 Reservoir	Visual Dam Safety	May 10, 2011
MA-0133	Puu Koa Reservoir	Visual Dam Safety	April 12, 2011
MA-0134	Koapala Basin	Visual Dam Safety	March 30, 2011
MA-0138	Kahakapao Reservoirs	Visual Dam Safety	April 26, 2011
MA-0139	Maui Field 290 Reservoir	Visual Dam Safety	April 12, 2011
MA-0142	Middle Field 14 Reservoir	Visual Dam Safety	May 10, 2011
MA-0143	Kaili Ili Reservoir	Visual Dam Safety	April 12, 2011
MA-0144	Mahinahina Reservoir	Visual Dam Safety	March 31, 2011
UMA-5007	Crater Reservoir	Visual Dam Safety	June 7, 2011
UMA-5019	Wailuku Water Reservoir 1	Visual Dam Safety	January 25, 2011
UMA-5056	Wailuku Water Reservoir 10	Visual Dam Safety	January 25, 2011
UMA-5057	Wailuku Water Reservoir 6	Visual Dam Safety	January 25, 2011
UMA-5064	Waikomoi Circular Reservoirs	Visual Dam Safety	April 26, 2011

Honolulu City & County Dams

State ID	Dam Name	Type of Inspection	Date of Inspection
OA-0017	Wahiawa Dam	Visual Dam Safety	December 7, 2010
OA-0018	Opaeula 01 Reservoir	Visual Dam Safety	February 3, 2011
OA-0019	Opaeula 02 Reservoir	Visual Dam Safety	February 3, 2011
OA-0021	Kemoo 5 Reservoir	Visual Dam Safety	December 7, 2010
OA-0022	Upper Helemano Reservoir	Visual Dam Safety	December 8, 2010
OA-0023	Helemano 6 Reservoir	Visual Dam Safety	December 8, 2010
OA-0025	Ku Tree Reservoir	Visual Dam Safety	October 13, 2010
OA-0045	Helemano 16 Reservoir	Visual Dam Safety	December 8, 2010
OA-0124	Kaneohe Dam	Visual Dam Safety	October 18, 2010
OA-0129	Waimanalo 60 MG Reservoir	Visual Dam Safety	March 24, 2011
OA-0137	Oahu Reservoir 155	Visual Dam Safety	September 2, 2010
UOA-2010	Helemano 11 Reservoir	Visual Dam Safety	December 7, 2010

Kauai County Dams

State ID	Dam Name	Type of Inspection	Date of Inspection
KA-0002	Puu Lua Reservoir	Visual Dam Safety	September 21, 2010
KA-0004	Kitano Reservoir	Visual Dam Safety	September 21, 2010
KA-0005	Mana Reservoir	Visual Dam Safety	September 21, 2010
KA-0010	Waiakalua Reservoir	Visual Dam Safety	July 20, 2010
KA-0011	Aii Reservoir	Visual Dam Safety	September 9, 2010
KA-0012	Kapaia Reservoir	Visual Dam Safety	September 9, 2010
KA-0014	Okinawa Reservoir	Visual Dam Safety	September 9, 2010
KA-0015	Kaneha Reservoir	Visual Dam Safety	July 20, 2010
KA-0016	Mimino Reservoir	Visual Dam Safety	July 20, 2010
KA-0024	Kalihiwai Reservoir	Visual Dam Safety	July 20, 2010
KA-0064	Field 2 Kealia Reservoir	Visual Dam Safety	August 31, 2010
KA-0065	Upper Anahola Reservoir	Visual Dam Safety	August 31, 2010
KA-0066	Lower Anahola Reservoir	Visual Dam Safety	August 31, 2010
KA-0067	Field 1 Kealia Reservoir	Visual Dam Safety	August 31, 2010
KA-0098	Alexander	Visual Dam Safety	April 7, 2011
KA-0099	Waita Reservoir	Visual Dam Safety	September 8, 2010
KA-0101	Hukiwai Reservoir	Visual Dam Safety	May 5, 2011
KA-0102	Ioleau Reservoir	Visual Dam Safety	May 5, 2011
KA-0103	Aepo Reservoir	Visual Dam Safety	February 15, 2011
KA-0104	Huinawai Reservoir	Visual Dam Safety	February 15, 2011
KA-0106	Kumano Reservoir	Visual Dam Safety	February 16, 2011
KA-0107	Puu O Hewa Reservoir	Visual Dam Safety	August 10, 2010
KA-0108	Kaupale Reservoir	Visual Dam Safety	February 16, 2011
KA-0110	Aepoalua Reservoir	Visual Dam Safety	February 15, 2011
KA-0111	Aepoekolu Reservoir	Visual Dam Safety	February 15, 2011
KA-0112	Aepoeha Reservoir	Visual Dam Safety	February 16, 2011
KA-0113	Omao Reservoir	Visual Dam Safety	February 17, 2011
KA-0114	Piwai Reservoir	Visual Dam Safety	February 16, 2011
KA-0115	Pia Mill Reservoir	Visual Dam Safety	August 10, 2010
KA-0118	Manuhonuhonu Reservoir	Visual Dam Safety	February 17, 2011
KA-0119	Mauka Reservoir	Visual Dam Safety	August 10, 2010
KA-0120	Papuaa Reservoir	Visual Dam Safety	September 8, 2010
KA-0121	Halenanahu Reservoir	Visual Dam Safety	September 8, 2010
KA-0145	Kauai Lagoons	Visual Dam Safety	May 5, 2011
KA-0146	Halaula Reservoir	Visual Dam Safety	May 26, 2011