

State of Hawaii  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
Engineering Division  
Honolulu, Hawaii 96813

November 22, 2010

Board of Land and Natural Resources  
State of Hawaii  
Honolulu, Hawaii

**Request for Final Approval to Repeal Hawaii Administrative Rules, Title 13, Subtitle 7,  
Chapter 190 and to Adopt Proposed Hawaii Administrative Rules, Title 13, Subtitle 7,  
Chapter 190.1 as Required by the “Hawaii Dam and Reservoir Safety Act of 2007”,  
Chapter 179D HRS – Dams and Reservoirs**

**I. ACTION REQUESTED:**

The Department of Land and Natural Resources ("Department") Engineering Division, hereby submits a request for approval to 1) Repeal Hawaii Administrative Rules ("HAR"), Hawaii Administrative Rules, Title 13, Subtitle 7, Chapter 190 and 2) adopt HAR, Title 13, Subtitle 7, Chapter 190.1, entitled “Dams and Reservoirs”.

**II. BACKGROUND, PURPOSE AND SUBJECT MATTER:**

During the 2007 Legislative session, the Legislature totally revised Chapter 179D of the Hawaii Revised Statutes (HRS), in an Act entitled the Dam and Reservoir Safety Act of 2007 (Exhibit 6). The purpose of Chapter 179D, HRS is to provide for the inspection and regulation of the construction, operation, and removal of certain dams and reservoirs in order to protect the health, safety, and welfare of the citizens of the State by reducing the risk of failure of such dams. Much of the impetus for the Legislature’s passage of the Dam and Reservoir Safety Act of 2007 was due to the breach of Ka Loko Reservoir on March 14, 2006, in which almost 400 million gallons of water was released from the Ka Loko Reservoir into Kilauea Bay. Seven lives were lost along with personal property including homes, vehicles, and vegetation along the path of destruction. Similar to the Ka Loko Reservoir, the Department has determined that more than 120 of the 134 regulated dams in the State are classified as high-hazard and could result in the loss of a life should these structures fail (see Exhibit 9).

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 revision of Chapter 179D, HRS by the State Legislature and the numerous changes, additions and deletions to the existing HAR necessary to implement the new requirements, penalties and fees allowed under Chapter 179D, HRS it was determined that Chapter 13-190 be repealed and that proposed chapter 13-190.1 be adopted. The proposed HARs are presented in various forms in Exhibit 1, 2, & 3. A summary of the proposed changes from the existing administrative rules are attached at Exhibit 4. The existing administrative rules (Chapter 13-190) are attached as Exhibit 5

**ITEM L-5**

These final proposed rules have addressed, where applicable, comments received from dam owners and other interested parties through a preliminary courtesy review in February 2010 and the formal public hearings conducted in October 2010, as stipulated in Chapter 91 HRS.

### **III. LEGAL AUTHORITY**

§91-3, HRS, relating to adoption of administrative rules

§171-6, HRS, relating to the Board of Land and Natural Resources' rule making powers.

§179D-9, HRS, relating to the Department adopting administrative rules for dam safety

### **IV. PUBLIC HEARINGS**

Four public hearings were held on October 12-15, 2010, one in each of the four counties. A total of 90 people attended the hearings. Both oral and written testimonies were received by the Department. Exhibit 3 highlights the revisions made to the proposed administrative rules to address comments & testimony received. The majority of the testifiers agreed that rules were needed for dam safety, but had comments to the proposed rules which can generally be classified into 8 categories. A summary of comments received for each category, discussion, and action taken are as follows:

#### **1. FEES**

Summary of comments received are as follows:

- The majority of comments received were concerns regarding the effect that the dam fee structure would have on agriculture. The fees may cause the closure of dams and affect the viability of agriculture in the state of Hawaii.
- With the fee structure, many dams will be closed, and farmers will use ground water for irrigation.
- Fees do not take into account the other values of dams, recharge of aquifers and helps sustainable agriculture, firefighting aid.
- Fees may affect rate structure, which require a rate structure change with the PUC.
- Exempt agricultural dams, make them get soil and water conservation plan.
- Make distinction between ditch fed dams and watershed dams where a valley is blocked up, can make two classifications for dams.
- Too costly to apply for permits to construct if just a small repair needs to be done it would be a disincentive to repair dams.
- Construction application fees too high and cap on fees needed for large projects. What are the fees for?
- Will there be a waiver for government owned dams?
- Fee structure does not recognize size of dams (holding capacity), in determining fees, high dam low capacity pays more than low dam with high capacity, sliding scale of some sort should be used.
- Asks that permit application fees for construction be capped at \$80,000 and use tiered scale starting at 2% for construction up to \$500,000 then reduced to 1% for construction up to \$5 million and then reduced to 0.05% for construction that exceeds \$5 million

Discussion:

Staff recognizes that any new or increased fee or potential fine/penalty will impact dam owners. However, the new law has been in effect since 2007 and provisions for violations/penalties are set by statute (Chap 179D-8, HRS). The Board of Land and

Natural Resources has the authority to require fees pursuant to Chapter 179D-6(8), HRS. Dam owners and the State of Hawaii both have obligations to ensure public safety due to the hazard potential of these dams and reservoirs and to reduce the risk of another dam failure.

A summary of the proposed fees are provided in Exhibit 10.

Dam owners had similar comments regarding fees after the first round of comments were received earlier this year. Staff evaluated its fee schedule at that time and reduced the Certificate to Impound fee from \$12,000 to \$400 every 5 years, which is reflected in this final version of the proposed rules. Upon receiving similar comments at the public hearings, staff once again evaluated the actual costs needed to run the Dam Safety Program against the amount of fees anticipated to be collected annually. Exhibit 7 identifies the actual cost of the program since FY 2008 and incorporates the collection of fees starting from FY 2011. Since 2009, just 3 years after the Ka Loko Disaster, the legislature eliminated all general funds previously appropriated for the dam safety program. Therefore, Exhibit 7 shows that fees are needed to support the program. The Department is unable to effectively perform the duties and meet the obligations mandated by the law without these fees.

After the failure of the Ka Loko Dam, the State provided funding in the amount of \$1.2 million to conduct a Phase I Investigation of each of the regulated dams. The reports from these Phase I investigations, which were distributed to the dam owners, provided an assessment of the conditions of each dam and recommendations for remedial actions to correct deficiencies observed during the inspection.

Additionally, to assist the dam owners, the Department has formulated an emergency action plan template, developed evacuation mapping and provided training for owners to complete this plan as required by the new dam and reservoir safety act of 2007.

**Action:**

The fee schedules have not been revised, however, staff recommends several incentives to assist dam owners, which are described below:

A pro-rated credit system against a dam owner's annual fee was initially proposed as an incentive for owners to repair their dams to make them safe. After reevaluation of this credit program, staff believes this would be unfair to dam owners who have already completed their repairs, as they would not benefit from this program. It would also be difficult for the Department to determine appropriate credits. As an alternative incentive program to assist dam owners, staff proposes that any complete application that is received and accepted by the Department within three (3) years after the adoption date of these administrative rules, the application fee will be assessed accordingly:

1. An application fee of one (1) percent (in lieu of 2%) of the estimated cost of construction, including engineering costs for the construction, enlargement, alteration, repair, or alteration to a dam. This fee percentage will also apply to removal of a dam which estimated cost of construction exceeds \$1million.

2. An application fee of one-half (1/2) percent (in lieu of 2%) of the estimated cost of construction, including engineering costs for the removal of a dam whose estimated cost of construction does not exceed \$1 million.

Adjustments to the fee will be assessed based on actual construction cost as described in Subchapter 8 of the proposed rules.

Staff believes this incentive program gives sufficient time for dam owners to plan, budget and secure funding required for their projects. This will also allow dam owners to retain and use the fee savings toward the necessary repair costs to remedy deficiencies at their dams.

## 2. DEFINITION OF DAM/JURISDICTIONAL DAMS

Summary of comments received are as follows:

- Take out significant hazard classification as Department has too much discretion in determining which dams are in the significant hazard category.
- Definition of dams confusing, clarify what dams are being regulated.
- Asked that definition of appurtenant works be amended by adding to the end of the definition “that affects the structural integrity of the dam or reservoir”, this is to ensure that i.e. hydroelectric works and penstock are not included in the definition.

Discussion:

There were some added clarifications in the purpose and applicability section of the draft HAR that was distributed for public hearings and the similar section within Chapter 179D HRS that outlined the definition and jurisdiction of dams under the Department. There was concern that the Department could regulate almost any structure with no lower threshold. In particular there was concern regarding the definitions of a “significant hazard” dam. This definition is quoted directly from the Chapter 179D HRS and therefore remains unchanged in the proposed rules.

Action(s):

These added clarifications were removed to help clarify the Board’s jurisdiction over dams, with the exception to allow the Board to include structures outside those specifically defined in the chapter if they are determined to be a high hazard. Staff revised the definition of an “appurtenant works” to limit them only to those that affect the structural integrity of the dam or reservoir, as commented.

## 3. VARIANCE

Summary of comments received are as follows:

- Variance should be given only by Board and not by the Department
- Who decides when Department gives variance and not have to go to Board?

Discussion:

A variance provision in the rules was added to give flexibility to the dam owners. Any major variance requested would go to the Board, and staff does not believe that all variances should be presented to the Board.

Action:  
No action taken.

#### 4. **DAM SAFETY STANDARDS**

Summary of comments received are as follows:

- Using the Probable Maximum Flood (PMF) is unnecessary, the standard cannot be met, data shows that rain fall will never approach PMF, even 1000-year storm standard is lower.
- PMF is not a proper legal standard and is based on old out dated report, not used by Feds anymore.
- PMF standard will make dams unsustainable, no way that dams can be upgraded to meet such standards, the standards will make all dams not eligible for certificate to impound.

Discussion:

The PMF is the commonly accepted standard used by the dam safety community (Federal and State) throughout the nation. The PMF is utilized as a conservative design storm event that is based on the probable maximum precipitation (PMP) possible for any geographic region. Although this figure is conservative, it is utilized due to the high risk associated with dams and reservoirs. Unlike any other flood control or drainage project, the failure of a dam or reservoir often results in the loss of life and the enormous damage to the surrounding infrastructure and environment.

As conservative as the PMF is believed to be, the PMF event is possible and has occurred in the past. The National Weather Service published Technical Report Number 25 in 1980 that compared greatest observed rainfalls with PMP used to calculate the PMF. Section 6.1 of this report identified storms that exceeded PMP (Smethport, PA July 17-18, 1942, Cherry Creek, CO may 30-31, 1935). The U.S. Bureau of Reclamation published a paper on another storm (Prescott, AZ September 22-23, 1983) in the American Meteorological Society's Monthly Weather Review, (Dec. 1986) pages 2344-2351: Rainfall Characteristics of the Prescott, Arizona, Storm of 22-23 September 1983.

Hawaii dams are capable of meeting these standards, as 23 regulated dams currently are capable of passing the PMF event.

Action(s):  
No action taken.

#### 5. **ENGINEERING REQUIREMENTS**

Summary of comments received are as follows:

- Need to clarify the type of engineers necessary, confusing with the use of owner's engineer, design engineer.
- Does rule require that engineer be on site at all times during construction, or can others help with daily reports?
- Requiring independent engineer to review would be extremely expensive for any owner.
- Requirement to have engineer for minor construction is cost prohibitive.

- Surveys to be done also expensive and not sure whether they are needed both before and after construction of a dam.
- Wanted to know if representatives from outer islands be able to take the place of engineer in daily logs or does engineer have to be there.
- Requires Hawaii licensed engineer, cannot use mainland licensed engineer?

Discussion:

There were questions regarding the term “engineer”, which was used to describe different roles throughout the permitting and construction sections. Concerns were raised as to the requirements for this engineer and possible duplication of efforts and redundant costs items. The Department reviewed these sections to clarify the term “engineer” and define each engineer’s roles and responsibilities as intended in the draft HARs.

Because of the specific concerns and requirements of dams and their design, engineers should have knowledge of dams and be licensed in the State of Hawaii. Construction engineers are specified to ensure that conformance to the plans and specification are met at a high standard of quality to provide the best assurance to minimize the potential for a dam failure.

Mainland engineers can apply to the State Department of Commerce and Consumer Affairs (DCCA) for licensing reciprocity.

Action(s):

1. The rules were revised to clarify the type of engineer roles: design engineer, construction engineer, and department engineers. The plain reference to engineer is defined in the rules as a licensed professional engineer registered in the State of Hawaii.
2. Section 190.1 -30 (1)(C) states that, “The construction engineer may assign some inspection tasks to a duly authorized agent, under the construction engineer’s supervision.” The construction engineer is not required to be on site at all times during construction. Similar requirements are stipulated in DCCA’s administrative rules for professional engineers, architects and land surveyors; Chapter 16-115(2).
3. A survey is required as the elevations on a dam structure have a critical impact on their performance. It also provides a reference for future evaluation of the structure’s performance.
4. The engineer requires a Hawaii Professional Engineer’s license.

**6. INSPECTIONS**

Summary of comments received are as follows:

- Are guidelines for inspections going to be part of rules?
- Can owners have personnel qualified to do self inspection?

Discussion:

The Department currently has existing dam safety guidelines covering the construction and inspection of dams; and interim guidelines for owners regarding alterations, repairs and removal of dams available on our website. These guidelines are currently being updated and will be made available to owners when finalized.

Owners are encouraged to train their personnel on the proper inspection and operation of dams and reservoirs. DLNR conducted a training seminar on the proper maintenance and operation of dams on Oahu in 2008. Owners are responsible to conduct inspection of their facilities in addition to any inspection conducted by the department.

Action:

No action taken.

## 7. **REMOVAL OF DAMS**

Summary of comments received are as follows:

- Can requirements be lessened to make it easier to remove dams?
- Can width of removal be less than 1/3 of height of dam? 1/3 seems excessive.
- Asks that section 13-190.1-20(d)(2) add change the term shall to may, as some requirements may not be required for certain types of work.

Discussion:

Staff believes that the question on dam removal requirements is one that can be addressed by using the variance provision provided for in the rules. It is difficult to make blanket exceptions in the rules as some removals may be more involved and present a hazard to the public if done inadequately. Some provisions in the general permit requirement section are likely not required for removals.

The rules had a specific requirement for the bottom width of a dam breach section as no shorter than 1/3 the dam height. This is to mitigate against possible clogging of the breach due to slope failure into the breach. Owners argued that in some cases, locally this would entail excavating out the entire embankment section and possibly some of the existing hillside. The Department felt that although this was a good rule of thumb, the intent could be mitigated through proper side slope requirements and stability calculations.

Action:

Staff revised the rules to allow for only required items for removal projects, thereby lessening the requirements for removal projects. Staff removed the 1/3 dam height to bottom width requirement. Staff believes that all other requirements are needed to ensure proper application for all types of removal work.

## 8. **MULTIPLE OWNERS**

Summary of comments received are as follows:

- Joint and several liability is not fair to small landowners who may own a portion of dam not involved in problem, would involve litigation.
- Joint and several liability oversteps the statutory authority of the division.
- Does not encourage dam owner that is really responsible to do work, let state do it and all the other owners are also liable for costs.
- Suggest using a variety of factors in determining responsibility for costs.
- There will be problems in determining owners when there is a condo situation, i.e. where there are multiple owners of one unit.

**Discussion:**

Staff considered a variety of ways to allocate costs between common owners and believes it is the responsibility of the owners to decide how to allocate costs among themselves.

**Action taken:**

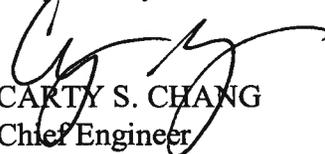
Staff deleted the joint and several liability references in the rule and will simply charge all owners for costs incurred when no action is taken.

**RECOMMENDATION:**

That the Board of Land and Natural Resources:

1. Approve the Repeal of Hawaii Administrative Rules, Title 13, Subtitle 7, Chapter 190 and adopt Proposed Amendments to the Hawaii Administrative Rules, Title 13, Subtitle 7, Chapter 190.1.
2. Approve the incentive program as described in the submittal.

Respectfully submitted,

  
CARTY S. CHANG  
Chief Engineer

APPROVED FOR SUBMITTAL:

  
LAURA H. THIELEN, Chairperson

**Exhibit List**

- . Exhibit 1 HAR, Chapter13-190.1 (Proposed Standard format)
- . Exhibit 2 HAR, Chapter13-190.1 (Proposed Ramseyer format)
- . Exhibit 3 HAR, Chapter13-190.1 (Proposed with highlighted revisions and comments from Board Approved Public Hearing Version)
- . Exhibit 4 Highlight of significant changes to HAR Title 13, Chapter 190, Dams and Reservoirs (Proposed New Chapter 13-190.1)
- . Exhibit 5 HAR, Chapter13-190 (existing)
- . Exhibit 6 HRS, Chapter 179D
- . Exhibit 7 Summary of Dam & Reservoir Safety Program Operating Expenses & Budget
- . Exhibit 8 Jurisdictional Size Chart
- . Exhibit 9 Chart of Regulated Dams in Hawaii
- . Exhibit 10 Summary of Fees in proposed HAR Chapter 13-190.1