



Dam Safety Policy and Interpretive Statement Public Review Draft

Policy Number: POL-5XXX

Program Name: Water Resources Program

Date Issued: 06/01/1991

Date(s) of Substantive Updates: TBD

Contact: Dam Safety Office

References: *Statute:* RCW 43.21A, RCW 86.16, RCW 90.03.

Administrative Rule: Chapter 173-175 WAC

Purpose: To describe and provide interpretation of statute (chapters 43.21A, 86.16, and 90.03 RCW) and rule chapter 173-175 WAC that directs the Department of Ecology's (Ecology) Dam Safety Office (DSO) to clarify the threshold(s) by which dams and dam structures are subject to dam safety-related statutes, rules, and policy statements.

Application: This interpretive and policy statement relates to dam safety. This document describes how the DSO intends to apply rule and statutes to assure the safety of life and property.

This policy supersedes any previous policy statement with which it conflicts.

ADA Accommodation

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Section 1. Definitions

1.1 Definitions

The following definitions are intended for informational purposes only to promote a common understanding of terms used in this policy and are not meant as legal definitions.

Active storage – refers to water stored above natural ground level that could be released by a failure of the impounding barrier. The 10 acre-feet threshold applies to dams that can actively impound water on either a permanent or temporary basis.¹

Dams and Controlling Works – refers to any artificial barrier including barrage, weir, spillway, locks, levees/dikes, canal, ditch, hydraulic power plant, reservoir, project, or other work, system, or plant together with appurtenant works that can or does impound or divert water.

Downstream hazard classification – is a rating to describe the potential for loss of human life or property damage if the dam were to fail and release the impounded water onto downstream areas. Downstream hazard classifications of 3, 2 and 1C, 1B, 1A correspond to low, significant, and high downstream hazard classes respectively.²

Emergency condition – means a situation where life and property below controlling works are at imminent risk from the flood waters from a dam failure and actions are needed within minutes or hours to initiate corrective actions or warn the public.

Periodic inspection – means a detailed inspection of the dam and appurtenant works conducted on regular intervals and includes as necessary, associated engineering analyses to confirm the continued safe operation of the project.

¹ Active storage capacity for jurisdictional determinations under WAC 173-175-020(1) is evaluated consistent with the reservoir volume calculation and hydrologic analysis methods described in Part II and Part IV of the Dam Safety Guidelines and applicable Technical Notes.

DSO applies those methods to determine the maximum storage that could be impounded at dam crest elevation under reasonably foreseeable operating conditions. See:
<https://apps.ecology.wa.gov/publications/documents/9255b.pdf>

² Downstream hazard classifications are determined in accordance with WAC 173-175-130 and the hazard evaluation procedures described in Part III of the Dam Safety Guidelines, Technical Notes 1. See:
<https://apps.ecology.wa.gov/publications/documents/9255e.pdf>

Section 2. Applicability of DSO Regulations

Chapter 173-175 WAC applies to dams having a potential active storage capacity of at least 10 acre-feet at crest elevation. The 10 acre-feet threshold applies to dams which can impound water on either an intermittent or permanent basis. Only water that can be stored above natural ground level or which could be released by a failure of the dam is considered in assessing the storage volume.

Under WAC 173-175-020(1), individual dams that actively store less than 10 acre-feet of water are exempt from the regulations of dam safety statutes and rules.

Where questions exist around whether a specific dam meets jurisdictional thresholds, the DSO will issue a written determination documenting the basis for its interpretation of statute and rule.

Under RCW 43.21A.068, dams or controlling works requiring a license under the Federal Power Act are not subject to the requirements of chapter 173-175 WAC. This exemption includes both federal and nonfederal dams licensed or exempted by the Federal Energy Regulatory Commission (FERC).

This policy does not apply to:

- Transportation facilities such as roads, highways, or rail lines which cross watercourses;
- Dikes or levees constructed along a watercourse; or
- Water storage tanks.

Under RCW 43.21A.064 Ecology is authorized to inspect all dams or controlling works and make changes to the construction and maintenance of these projects to protect from the threat of loss of life or property.

Under RCW 86.16.035, Ecology has authority to adopt regulations for the flow of water from all dams in rule, defined in WAC 173-175-610, to protect from the threat of loss of life or property.

Section 3. Multiple Dams in a Series

3.1 Evaluation of Multiple Dams in a Series

The DSO may determine that individual dams and controlling works that actively store less than 10 acre-feet of water are considered a single dam system of multiple controlling works and will be evaluated together. The DSO will review this system to determine the downstream hazard classification for each individual dam and controlling works, and the hazard classification as a whole system. As such, under RCW 86.16.035, Ecology may inspect or adopt regulatory actions controlling the flow of the individual dams and controlling works as a single dam system when there is a threat to the loss of life or property that would be caused from a failure of the system.

The DSO will determine that one or more dams within a series are subject to chapter 173-175 WAC when:

- The failure of one or more dams in a series, could independently or cumulatively by failure of other dams, pose a significant threat to human life or property. This determination is based on documented downstream hazard analysis and is at the reasonable assurance of protection of human life.

Where individual dams or lagoons share common embankments or hydraulic connectivity such that failure of one cell would result in the release of adjacent stored water, the DSO will evaluate the system as a single dam for purposes of the volumetric threshold and downstream hazard classification.

The following settings will be analyzed as a single dam system:

- Multiple dams in a series;
- Dams along a single watercourse;
- Dams in a multi-cell lagoon configuration; and
- Dams within a hydraulically connected system.

Section 4. Engineering Approval, Issuance of Construction Permit, and Construction Change Orders

Construction activities affecting dam safety-regulated components may not begin until the applicant receives a dam construction permit under RCW 90.03.350. Pre-construction activities not affecting dam safety-regulated components may proceed at the owner's risk, provided they do not constitute construction or modification of the dam.

4.1 Engineering Approval

The dam owner submitting an application for a dam construction permit must designate a project engineer who is responsible for ensuring completion of the following before the department issues a construction permit for a new dam or a modification of an existing dam:

- Obtain DSO approval of engineering design reports and associated information, as required under WAC 173-175-130;
- Submit construction plans and specifications meeting standards under WAC 173-175-140 that conform to accepted engineering practice, and Part IV of the Dam Safety Guidelines;
- Pay the applicable construction permit fee;
- Obtain DSO approval of construction Inspection Plan developed in accordance with WAC 173-175-170; and
- Complete State Environmental Policy Act (SEPA) review requirements for the application (See section 4.4 of this policy).

4.2 Construction Permit and Inspection

Under WAC 173-175-100 a Construction Inspection Plan must be submitted and approved by the DSO before construction work may begin. During the construction permit process, a dam owner should follow the guidance provided in Section 4 in Part II of the Dam Safety Guidelines. Under WAC 173-175-180 the DSO project engineer approves the Construction Inspection Plan prior to approving the construction plans and issuing the construction permit.

Approval of construction plans and specifications will be based on conformance of the plans and specifications with accepted engineering and construction practice and with criteria in the Dam Safety Guidelines. A DSO engineer signature and plan approval stamp constitutes an agency endorsement that the proposed design and construction methods will result in acceptable structural integrity and safety of the project. Approval indicates that, based on the information provided, the plans appear to conform to accepted engineering practice and applicable statutes and rules. Approval does not:

- Relieve the dam owner of responsibility for construction in accordance with approved plans;
- Relieve the owner or engineer of responsibility for design adequacy; or
- Constitute a warranty or guarantee of structural performance.

When construction is proposed in phases, each phase that affects dam safety-regulated components must receive approval prior to implementation. The DSO may condition permit approval to ensure that partially completed phases do not create unsafe conditions.

Construction plans and specifications received for review after project construction will not be signed by the DSO project engineer nor endorsed with the DSO “Approved for Construction” stamp.

4.3 Change Orders

Under WAC 173-175-190, the DSO must approve proposed changes to approved plans that could affect the structural integrity or safe operations of the project. Construction change orders must be approved by the DSO for changes that:

- Represent a significant modification to the originally approved plans or specifications.
- Could impact the structural integrity or safety operation of the project.
- Could affect project safety.

If field conditions necessitate immediate action to protect life or property, temporary measures may be implemented, provided the DSO is notified as soon as practicable and formal review follows.

4.4 SEPA Requirements

Engineering review of plans and specifications may proceed concurrently with SEPA review. However, a dam construction permit will not be issued until SEPA review is complete and a threshold determination or final environmental document has been issued in accordance with chapter 197-11 WAC.

WAC 197-11-880 exempts emergency situations from completing SEPA requirements.

Section 5. Periodic Inspection of Existing Dams & Records Management

5.1 Hydropower Dam by the Federal Energy Regulatory Commission (FERC)

Under WAC 173-175-020(3), the DSO will not review and approve construction plans and specifications, charge plan review fees, or conduct construction or periodic inspections of these projects provided the federal agency or their designated consultant conducts regular periodic inspections by qualified dam safety engineers. The DSO only retains information of construction plans and inspection reports that is shared from FERC licensed or FERC exempted projects and defers to FERC for records retention rules and regulations.³

5.2 Federally Owned and Operated Dams

Under chapter 42.56 RCW, the DSO retains records in accordance with state records retention schedules. The DSO only retains information of construction plans and inspection reports that are shared by the U.S. Army Corps of Engineers and the Bureau of Reclamation dam safety programs for dams owned by a federal agency.

Dams owned by a federal agency that are not included in an existing dam safety program are subject to regulations under chapter 173-175 WAC. Ecology is identified as the agency responsible for conducting periodic inspections of these dams in accordance with any existing memorandum of understanding between the federal agency and Ecology.

5.3 Ecology Sole Regulatory Agency

Under WAC 173-175-705, Ecology conducts periodic inspections of existing dams at regularly scheduled intervals.

Intervals for periodic inspections are as follows:

- Dams with high downstream hazard classifications will be inspected every five years.
- Dams with significant downstream hazard classifications will be inspected every five years.

³ See Chapter 14 of the Dam Safety Engineering Guidelines from the Federal Energy Regulatory Commission's Dam Safety Performance Monitoring Program (DSPMP):
<https://www.ferc.gov/sites/default/files/2020-04/chap14.pdf>

For dams with significant downstream hazard classifications, inspection intervals may be adjusted to 10-years based on documented risk prioritization, resource constraints, and project performance history, consistent with WAC 173-175-705. This includes:

- Documented structural deficiencies;
- Age and condition of the structure;
- Consequence of failure; and
- Changes in downstream conditions.

Dams with a low downstream hazard classification will be inspected on an as-needed basis. The primary reasons for inspecting low hazard dams are:

- In response to public requests under WAC 173-175-735;
- Downstream hazard reclassification review WAC 173-175-725(1a)(1e); and
- Observed or reported deficiencies.

Section 6. Dams Constructed Without Prior Dam Safety Office Approval of Plans and Specifications

Construction of a dam without prior plan approval is a violation of RCW 90.03.350. The issues of structural integrity and project safety will be addressed under WAC 173-175-620(2).

The DSO will inspect the safety and structural integrity of any dam found that was:

- Constructed or modified without prior approval of construction plans and specifications; or
- Not inspected by DSO or a predecessor state agency.

The owner is not allowed to fill a reservoir created from unapproved dam until the structural integrity and safety of the dam or controlling works is shown to the satisfaction of the DSO.

6.1 Determining Structural Integrity

If deficiencies are of a minor nature and a failure of the dam would not pose a threat of loss of life or result in extensive property damage, the DSO will conduct simplified analyses and notify the owner of any safety deficiencies.

In situations where the failure of the dam would pose a threat of loss of life, it will be the responsibility of the owner and their engineering consultant to conduct sufficient investigations and analyses to document the structural adequacy of the dam or propose modifications to correct safety deficiencies.

As-built plans will be required from the dam owner to document the layout of the project, but no DSO "Approved for Construction" stamp will be issued for as-built plans in this situation (See section 4 of this policy).

Section 7. Compliance Actions

Under WAC 173-175-620, the DSO may issue regulatory orders to dam owners to correct safety deficiencies on a given project. If these corrections are not voluntarily met in a reasonable period of time, enforcement may proceed under applicable provisions of chapter 90.03 RCW.

Ecology may take enforcement action based on the risks of failure and the seriousness of safety deficiencies identified. Actions are based on the downstream hazard classification and the safety deficiencies compared to the condition of the dam or controlling works.

Section 8. Operation and Maintenance Manuals and Emergency Action Plans for Dams

Under WAC 173-175-500, all dam owners are required to develop an Operation and Maintenance (O&M) Manual.

Under WAC 173-175-520, owners of a dam with a High or Significant downstream hazard classification, must also develop an Emergency Action Plan (EAP).

Under WAC 173-175-040 and WAC 173-175-530 all dams where incidences occur, or when emergency conditions arise, are required to notify Ecology. Under WAC 173-175-510 all owners of dams or other controlling works are required to conduct annual inspections and provide the inspection report to Ecology. The DSO recommends that these procedures be incorporated into the O&M Manual.

The DSO recommends that emergency procedures be developed by owners of a dam with a Low downstream hazard classification (i.e., whose failure would cause limited property or environmental damage, and no loss of life is expected).

Section 9. Spillway Requirements for Off-Channel Storage Facilities

9.1 Jurisdiction

Under RCW 86.16.035, Ecology has authority to adopt regulations of flow from dams, which includes for the operation and maintenance of emergency spillways.

The DSO considers off-channel storage facilities that have embankment structures to impound water as appurtenant works of dams and thus subject to the regulations under chapter 173-175 WAC. Spillways are necessary features of dams and controlling works, including off-channel storage facilities.

Best engineering design practices for principal and emergency spillways are described under the Dam Safety Guidelines Parts III and IV.

9.2 Exceptions

Two exceptions for including emergency spillways at off-channel storage facilities are as follows:

Condition 1. Excess storage available

Off-channel storage facilities where the active storage capacity and associated freeboard are sufficient to contain several years of reservoir inflow.

Condition 2. Outlet works with operations

Off-channel storage facilities that have:

- Full time operators;
- Sufficient storage capacity to accommodate three days of process water inflow at the maximum rate plus the natural inflow from the design storm; and
- Permanent outlet works with discharge capacity beyond the maximum combined inflow from process water and natural sources.

Section 10. Emergency Response and Discretionary Actions During Emergency or Exigency Conditions

10.1 Emergency Response

In those cases where a failure of the dam could pose a threat to life (downstream hazard classes 1A, 1B, 1C, and 2, per WAC 173-175-130), the dam owner shall develop and maintain an EAP acceptable to the DSO. Even when a failure does not pose a threat to life, but significant economic or environmental impacts are expected (downstream hazard class 2E), the dam owner shall develop and maintain an EAP acceptable to the DSO.

Refer to Guidelines for Developing Dam Emergency Action Plans for procedures, agency protocols, and other guidance to be followed in response to emergency condition of dams where life and property are at imminent risk.

10.2 Discretionary Actions

Under WAC 173-175-610, the DSO may take control of the project and take actions deemed necessary to respond to emergency conditions to protect life and property. The following describes how Ecology exercises this emergency authority:

- Actions are limited to those reasonably necessary to abate imminent threat.
- Temporary emergency measures do not permanently alter regulatory status.
- Following emergency stabilization, the DSO may provide required corrective actions.