

Ecology inspection program targets dams built without permits which pose a risk to people and property

The Washington Department of Ecology is conducting an inspection program of dams built without permits which may pose a risk to people and property.

At least 96 irrigation and industrial ponds, sewage lagoons and dairy waste lagoons were identified statewide in aerial photos that appeared to be “high hazard” reservoirs, holding at least 10 acre-feet of water or liquid and located upstream from at least three homes.

Loss of life in Hawaii, property damage in Washington

Washington state has never experienced a dam failure which has resulted in loss of life, such as the March 14, 2006, collapse of the Kaloko dam on Kauai, Hawaii, which killed seven people. News reports of that catastrophe described “a flash flood of black water that uprooted homes, exploded power transformers in flashes of blue light and left dozens of trees bobbing in the ocean.”



Kershaw Dam failure in Yakima County in April 2005.

In April 2005, however, failure of an unpermitted 15 acre-foot frost control dam in Yakima County, Wash., resulted in significant property damage.

The pond was built some 30 years ago without securing the necessary permits and most importantly without engineering plan review or construction inspection. Then without proper

MORE INFORMATION

A reservoir permit may also be required for your dam. Information on reservoir permits can be found on the Web site at:

[http:// www.ecy.wa.gov/programs/wr/dams/dss.html#reservoirpermit](http://www.ecy.wa.gov/programs/wr/dams/dss.html#reservoirpermit)

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authorization, in the fall of 2004, the owner hired a contractor to replace the aging low level outlet pipe. The contractor cut a deep trench through the dam and backfilled, again without engineering review or construction inspection.

The dam failed within days of its next filling. A witness to the event described seeing an upwelling of sand and water over the buried pipe some tens of feet off the dam toe. Within 15 minutes that upwelling had moved upstream some 100 feet, opening a gaping hole through the dam. The resulting flood buried the pump station electrical service (fenced area in photo), eroded away sections of an unpaved county roadway and passed out an undershot of a nearby canal before finally being contained by a system of downstream ponds. Lawsuits seeking financial damages from the dam owner have yet to go to trial.

Frost ponds have proved to be an effective means of minimizing frost damage to budding trees for orchard owners. Spraying a fine mist of water serves to raise air temperatures a critical degree or two as the mist freezes. The method is so successful that smudge pots and wind machines have largely become a thing of the past but five unpermitted frost ponds have failed in Washington state after owners skirted legal requirements.

Letters seek cooperation with property owners

The Department of Ecology has sent letters to owners of unpermitted high hazard dams asking permission for inspectors to enter private property. Ecology’s Dam Safety Office is asking property owners to voluntarily bring their dams into compliance with dam safety regulations by correcting deficiencies identified in the inspections. For most situations, this means hiring an engineer after the Ecology inspection to assess the dam in detail and recommend modifications necessary to bring the facility up to current safety standards. In those cases where the dam has serious safety deficiencies that could pose an imminent threat of failure, Ecology may order emergency repairs to be made immediately, or require the reservoir level to be lowered.

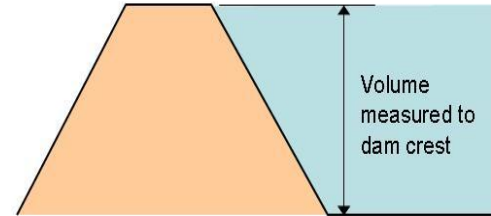
Once a reservoir owner completes any required modifications, and all other needed state permits are obtained, the dam will be in compliance. Owners failing to correct deficiencies could face fines up to \$5,000 per day. Ecology can also order dangerous dams to be drained and removed.



Aerial photographs of ponds

Q: How do I know if my dam falls under Ecology's authority?

A: If the reservoir impounded behind your dam can store 10 acre-feet (3.26 million gallons) or more above ground level, then it falls under Ecology's authority in RCW 90.03.350. This volume is measured from the toe to the crest of the impounding barrier. There is no minimum height for a dam to be under Ecology's authority. A pond holding 10 acre-feet of water would be equivalent to a football field, 8 feet deep.



Cross section diagram

Q: What should I do if I've built or own an unpermitted dam that falls under Ecology's authority?

A: Report your dam to Ecology to have it inspected by Ecology engineers who will advise you on how to bring the dam in compliance with state standards.

See Dam Safety Office contact information at the end of this publication.

Once the dam has passed an Ecology inspection, all deficiencies have been corrected and you have obtained all other needed permits, your dam will be accepted into the Dam Safety inventory and considered a legal facility.

Q: What can I do with my dam to avoid it falling under Ecology's authority?

A: One option is to construct or reduce the height of your dam so that it impounds less than 10 acre-feet (AF) at dam crest level. Another option would be to excavate the reservoir all or partially below ground level. Only the volume contained between the higher portion of the pond floor or the lowest exterior grade at the outer dam toe **and** the dam crest counts towards the 10 AF volume threshold. However, even if your impoundment is too small to fall under Ecology's authority, you may be liable for property damage if your dam fails. Therefore it is always prudent to have a licensed engineer design any impoundment structure, oversee its construction and periodically inspect it.

Q: What other permits are needed for my dam?

A: You may need a reservoir storage permit and/or water right for the use of the water impounded behind the dam. You should contact one of Ecology's Regional Offices for assistance in determining whether a permit or water right is needed.

See the first page sidebar for Regional Office contacts.

Q: Are there any fees associated with owning a dam?

A: If your dam has a low downstream hazard rating (no lives at risk), then there are no annual fees. However, if your dam has a high (3 or more homes at risk) or significant (1 or 2 homes at risk) downstream hazard rating, then a prorated annual inspection fee is charged, which is adjusted annually for inflation. The 2009 significant hazard fee is \$625. The high hazard fee is \$856. These fees pay for an inspection every 5 years. [Note: 2009 legislation requires that significant hazard dams are inspected every 5 years; previously it was every ten.]

Q: What if I want to build a new dam that stores 10 or more acre-feet?

A: You will need to follow the standard dam safety permitting process. This entails hiring an engineer to design the pond and prepare plans and specifications. A dam construction permit must be submitted to Ecology along with the plans and a \$1400 application fee. Ecology issues a Construction Permit when the construction plans and specifications, and Construction Inspection Plan have been found to be acceptable and upon payment of applicable plan review fees.

Q: How do I get more information on dam inspections, dam permits and dam construction?

A. You may contact the Dam Safety Office at:

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Phone: (360) 407-6623
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You can visit the Dam Safety Web site at:

<http://www.ecy.wa.gov/programs/wr/dams/dss.html>