

# Dam Safety

## PERMIT GUIDELINES for DAMS

These guidelines are intended for landowners and engineers who are involved in activities requiring a dam safety permit from the Department of Natural Resources-Division of Waters (DNR-DOW). These activities are new construction, repair, alteration, removal, and transfer of property containing a dam. The complete dam safety rules are contained in Parts 6115.0300 through 6115.0520 of the DNR Public Waters Resources rules.

### What is a Dam?

A dam is any artificial barrier which does or can impound water. The height of a dam is the vertical distance from the natural bed of the watercourse to the highest elevation which water may be impounded during extreme flood conditions. The storage capacity of a dam is the maximum volume of water that can be impounded to the top of dike elevation. Storage capacity is normally measured in acre-feet, the amount of water needed to flood a one-acre area one foot deep.

### Why is a Permit Needed ?

- A dam may fail and release the energy of the impounded water. This can cause loss of life, property damage, environmental damage, and negative economic impacts due to loss of the impoundment.

- The permit requirement for dams is intended to ensure safe design, construction, operation, and maintenance.

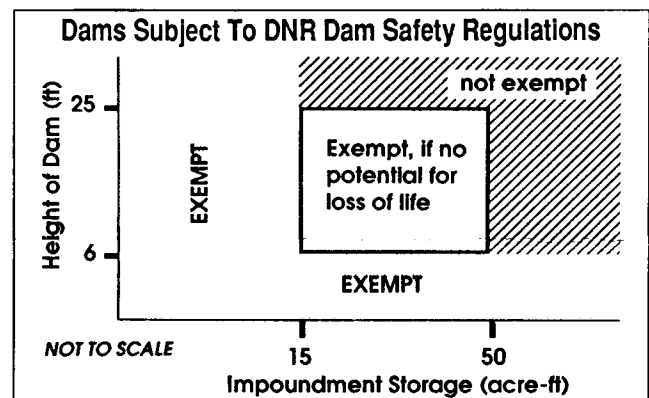
- A dam could impound water on another person's property.

- A dam could significantly alter a watercourse or the environment.

- Dams remain in place for many decades and must be designed and built properly to remain safe and functional over this period.

### Do I Need a Permit ?

- A permit is needed from the DNR-DOW to construct, alter, repair, remove, or transfer ownership of a regulated dam. Not all dams are regulated or require a permit. Regulated dams which are subject to existing dam safety rules are shown on the following graphic of dam height and impoundment storage.



- Federally-owned dams and dams determined by the DNR-DOW to be non-hazardous are exempt from the dam safety rules.

- Dams not subject to the dam safety rules will still require state and federal permits, if they involve filling of protected waters or wetlands.

## □ How to Obtain a Permit

A permit application form may be obtained from any office of the DNR-DOW. The application and supporting project documentation should be submitted for review to the DNR-DOW office in the area where the dam is located. Reviewing the application and issuing or denying the permit is normally completed within sixty days. An application fee of \$150 is required. Also, a construction fee may be required for new construction of privately-owned dams.

## □ What is Required in a Permit Application ?

- The applicant must understand that owning a dam brings significant responsibilities and can create liabilities in case of misoperation or dam failure. The applicant needs to have the financial means to properly operate and maintain the dam. Dams are normally designed for much larger floods than are culverts or bridges.
- Information demonstrating that the dam will provide quantifiable benefits and will be in compliance with prudent environmental practice.
- The applicant must engage a professional engineer registered in Minnesota, who has experience in dam engineering to prepare the design, plans, specifications, inspect the construction, and establish operation and maintenance procedures for the structure. The permit application may be rejected, if the engineer is not

qualified or the design is flawed. Engineering costs for a small dam typically range from \$15,000 to \$30,000.

- A detailed list of items that may be needed in the design report is included in the dam safety rules. A design report submitted with the application must include, as a minimum, the following items:

- An evaluation of the consequences of a dam failure. This may require a dam break analysis. This will determine the hazard classification and level of design standard for which the dam must be designed. The DNR-DOW dam safety official will have to verify the hazard classification, so the designer should get this approved before proceeding with the final design and plans.

- A map with an outline of the contributing drainage area and a property ownership map showing the outline of the dam, the normal pool, and the maximum pool for the design flood event. The dam owner must have ownership of necessary land rights.

- A site topographic survey and proposed dam elevations that are referenced to the United States Geological Survey datum.

- A computation of the normal and maximum impoundment volume. If a permit exemption based on a small impoundment volume is requested by the applicant, the computations must be based on a reservoir bottom contour interval of no more than two feet.

- A hydrologic/hydraulic analysis based on the hazard classification and design level approved by the DNR-DOW dam safety official. The top of the dam must have appropriate freeboard above the design flood elevation. The spillway works of the dam must be able to pass the design discharge safely without eroding the tailwater (downstream) side of the dam.

- A geotechnical analysis of seepage, slope stability, and foundation stability. Appropriate soil borings and testing are needed to complete these analyses.

- A stress analysis of concrete, steel, or timber structural members.

- Final plans and specifications for construction that are signed and dated by the design engineer. They must include guidelines for foundation preparation, type of embankment fill, source of borrow material, and placement of fill.

• The commissioner of natural resources may waive certain details in permit submittals for low hazard dams sponsored by a government agency or engineered by a federal agency.

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The DNR Information Center phone numbers:  
Twin Cities: (651) 296-6157  
MN Toll Free: (888) 646-6367  
Telecommunication Device for the Deaf:  
(651) 296-5484  
MN Toll Free: 1-800-657-3929

## □ What will a Permit Authorize and Require ?

• For privately-owned dams, the permit must be recorded with the county before construction can proceed.

• The allowed construction activities will be specified in the permit.

• Before starting construction, the permittee will have to submit information on water diversions, cofferdams, erosion control measures, and construction procedures.

• The design engineer will be required to inspect the work during and at completion of construction to ensure the work is in conformance with the approved design, plans, and specifications.

• The design engineer and permittee will be required to submit a final construction report, including as-built plans and certification of the construction.

• The dam owner will be responsible for safe operation and maintenance and may have to submit an appropriate plan for this.

• After completing construction, the owner may be required to get an "approval to impound water" from the DNR-DOW dam safety official.

• The project will have to comply with all regulations of other federal, state, or local agencies. An Environmental Assessment Worksheet (EAW) may be required by the Environmental Quality Board.

**Transferring Ownership of a Dam**

Ownership transfer of a dam requires a permit from the DNR-DOW. Real estate sales may involve land on which a dam is located. The purchaser of the property must be aware of the dam, the responsibilities of owning a dam, the structural condition of the dam and the repair costs that may be involved to bring the dam up to standards.

**Fees**

In addition to the \$150 permit application fee, an initial construction/inspection fee may be required for privately-owned dams. This fee is based on a percentage of the construction cost, as specified in the dam safety rules. For example, the fee for a \$100,000 dam is \$2,500, and the fee for a \$300,000 dam is \$5,500. Also, a periodic inspection fee may be assessed by the state for privately-owned dams.

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