Preliminary Design Report for Dams

It is strongly recommended that applicants submit a preliminary design report to the Division of Water Resources Management for approval of the design concept prior to initiation of a detailed design study. This report should include:

A. Ownership and Engineer Information

1. The owner of the dam (names, addresses, telephone numbers)
2. The owner's engineer (names, addresses, telephone numbers, a description of expertise in the investigation, design, construction, and operation of dams, and a listing of previously acquired permits for dams from the Office of Water Resources or its predecessors)

B. Purpose, Location and Configuration

General information regarding the dam and appurtenances. This information should include a statement of the purpose for which the dam is to be used, a legal description of the location of the dam, calculations to verify the drainage area controlled by the dam, the height of the dam and the maximum impounding capacity of the dam.

C. Downstream Hazards and Breach Analysis

In order for OWR to provisionally determine the dam classification, as described in the "Rules for Construction and Maintenance of Dams", information describing the downstream area for a distance of at least two miles is required. This information should include the number of and access to homes and buildings, roads, utilities and other property that would be endangered should failure of the dam occur. Contoured aerial photographs or recent U.S. Geological Survey topographic maps may be used for this purpose. Submittal of additional data, including a dam breach analysis, may be necessary at some sites. If a dam breach analysis is submitted, it should include failures during a range of events from normal pool through the Probable Maximum Flood. The owner should also be cognizant of the possibility for development of the downstream area which could change the dam classification and require modifications to the dam. The original design should provide for these modifications to be more easily accomplished.

D. Topography

Maps showing the location of the proposed structure that include the location of county and State roads, access to the site, the outline of the reservoir at normal pool elevation, the drainage area limits, and the general topography of the dam site and reservoir area. Contoured aerial photographs or recent U.S. Geological Survey topographic maps may be used for this purpose.

E. Plans and Drawings

Preliminary drawings that include cross-sections, plans and profiles of the dam, proposed pool levels, and types of spillways.

F. Basic Design Criteria

Preliminary design criteria including a description of the size, ground cover conditions, and extent of development of the watershed; the proposed geotechnical and exploration testing program, geology and geotechnical engineering assumptions for the foundation and embankment materials; the proposed hydrologic and hydraulic analyses methods; and the type of materials to be used in the dam and the spillway system(s).

Specific plates or figures appropriate for the dam should be included.

In order for the Office of Water Resources to assess the safety aspects of a dam from an engineering standpoint, the final design report submitted with the Permit Application must contain the information and calculations to verify the adequacy of the design for the given size and downstream hazard potential of the dam. The safety evaluation will be based upon the capability of the project to meet the minimum performance standards established in the "Rules for Construction and Maintenance of Dams". The remaining sections of these guidelines have been written as an aid in the preparation of the data required to support the application for permit.

Computer programs which are used in the preparation of data for submittal should either be federal public domain programs or have sufficient documentation submitted with a copy of the program to allow for the review of the program. Spreadsheet allow for the review of their equations. The data generated by all computer programs and spreadsheet applications may not be accepted as correctly representing the information required to be submitted.

In general, procedures developed by the following agencies are acceptable: U.S. Army Corps of Engineers; U.S. Department of the Interior, Bureau of Reclamation; U.S. Department of Agriculture, Natural Resources Conservation Service; and U.S. Department of Commerce, National Weather Service. The Office of Water Resources will use the Corps of Engineers and the National Weather Service computer programs as its primary review aids. The programs typically used by OWR for review include: HEC-1, HEC-HMS, HEC-2, HEC-RAS, and FLDWAV.