

**Forest Service Manual
National Headquarters (WO)
Washington, DC**

Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

Duration: This amendment is effective until superseded or removed.

Approved by: James Pena, Associate Deputy Chief, NFS

Date approved: May 11, 2011

Responsible Staff:

Last Change: 7500, Amendment 7500-2000-1

Superseded Document(s): 7500_zero_code, Amendment 7500-2000-1, September 11, 2000

Digest: Following is an explanation of the changes throughout the directive by section.

7500: Changes classification of dams from A, B, C, and D and low, medium, and high hazard potential to low, significant and high hazard potential classification throughout the chapter.

7501: Removes obsolete authority “Water Resources Development Act of 1992.” Clarifies that direction does not apply to congressionally withdrawn water projects.

7501.1: Establishes code, caption “Laws,” and sets forth new laws for the National Dam Safety Program Act, the Security Act, and Title V of the Federal Land Policy and Management Act.

7501.2: Establishes code, caption “Regulations,” and recodes to this section regulations previously set out in section 7501.

7501.3: Establishes code, caption “Other Authorities,” and recodes to this section reference to the Presidential Memorandum of October 4, 1979, previously set out in section 7501.

7502: Revises objectives for managing dams administered by the Forest Service.

Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

7503: Revises, reorganizes, and removes obsolete policy statements.

7503.1: Establishes code, caption, and sets forth new policy statements for “Actions Required for Deficient Dams.”

7503.2: Establishes code, caption, “General Considerations,” and recodes to this section policy statements previously set out in 7503.

7504: Removes exhibit 01.

7504.2: Adds new responsibility to the Washington Office, Director of Engineering for establishing policy, standards, and criteria for water storage and transmission.

7504.4: Adds direction that regional foresters may delegate responsibility for certain activities to regional directors of Engineering. Adds direction for coordination and execution of agreements with regional offices of Federal, State, and local governmental agencies that own or regulate dams in their region.

7504.5: Recodes caption and direction to 7504.6. Establishes caption and sets forth new direction on responsibilities for “Regional Directors of Engineering.”

7504.6: Establishes code, and recodes to this section caption and direction previously set out in 7504.5.

7505: Adds definitions specific to this manual.

7506: Recodes caption and direction to 7507. Establishes caption “Jurisdictional Dams,” and sets forth direction on criteria to place dams under the jurisdiction of FSM 7500.

7507: Establishes code, recodes to this section caption and direction previously set out in 7506. Adds new references for Federal Guidelines for Dam Safety, Design of Small Canal Structures, an EPA Technical Report, and State of Idaho Rules of Tailings Dams. Removes obsolete references to Interagency Committee on Dam Safety and FEMA Glossary of Terms.

Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

Table of Contents

7501 - Authority	4
7501.1 - Laws.....	4
7501.2 - Regulations	4
7501.3 - Other Authorities	5
7502 - Objectives.....	5
7503 - Policy.....	5
7503.1 - Actions Required For Deficient Dams	5
7503.2 - General Considerations in Design, Construction, Operation, and Maintenance of Dams.....	6
7504 - Responsibility	6
7504.1 - Chief	6
7504.2 - Washington Office, Director of Engineering	6
7504.3 - Dam Safety Officers.....	7
7504.4 - Regional Foresters.....	7
7504.5 - Regional Directors of Engineering	7
7504.6 - Forest Supervisors	8
7505 - Definitions	9
7506 - Jurisdictional Dams	16
7507 - References	16
7509 - Handbooks.....	17
7509.1 - Servicewide Handbooks.....	17
7509.11 - Dam Management Handbook	17

7501 - Authority

The construction, operation, and maintenance of dams on National Forest System lands are conducted under the laws and regulations of the U. S. Department of Agriculture (USDA), Forest Service; the U.S. Department of Defense, U.S. Army Corps of Engineers (Corps); and the Federal Energy Regulatory Commission (FERC). The authorities in this section establishes direction on investigation, design, construction, emergency planning and response, and operation and maintenance of all dams operated by the Forest Service or by the holder of a special use authorization issued by the Forest Service on National Forest System lands. The authorities do not apply to dams authorized by a pre-Federal Land Policy Management Act right-of-way or to congressionally withdrawn water projects.

7501.1 - Laws

1. National Dam Safety Program Act of 1996 (33 U.S.C. 467-467j). This act establishes the National Dam Safety Program and names the Director of the Federal Emergency Management Agency (FEMA) as its coordinator. Under this Act, Federal agencies are required to report to FEMA on the status of their policies, standards, and procedures to bring their dam safety programs in conformance with the Federal Guidelines for Dam Safety.
2. National Dam Safety and Security Act of 2002 (33 U.S.C. 467-467j). This act reauthorizes the National Dam Safety Program and adds the requirement to include an assessment of each dam, based on inspections completed by either a Federal agency or State dam safety agency, in the National Inventory of Dams (NID).
3. Title V of the Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1761-1771). This act authorizes the Forest Service to issue special use authorizations for dams on National Forest System lands.

7501.2 - Regulations

1. Departmental Regulation 1043-18. This Departmental regulation establishes the USDA Dam Safety Committee, requires member agencies to name a Dam Safety Officer, assigns the Natural Resources Conservation Service (NRCS) Dam Safety Officer as the USDA contact for FEMA, and requires the Forest Service Dam Safety Officer to participate in technical dam safety activities with FEMA.
2. Title 36, Code of Federal Regulations, Part 251, Subpart B. These Forest Service regulations, authorized in part by Title V of FLPMA, govern issuance of special use authorizations for dams.
3. Title 18, Code of Federal Regulations, Part 4. These regulations promulgated by FERC govern issuance of licenses and permits by FERC for dams used for power generation (FSM 2770).

4. Title 33, Code of Federal Regulations, Part 208. These regulations issued by the Corps govern use of storage allocated for flood control at all reservoirs constructed entirely or partially with Federal funds. These regulations typically are implemented through execution of a memorandum of understanding between the Corps and the project owner.

7501.3 - Other Authorities

Presidential Memorandum of October 4, 1979. Directs Federal agencies to implement the Federal Guidelines for Dam Safety published by the Ad Hoc Interagency Committee on Dam Safety of the Federal Coordinating Council for Science, Engineering, and Technology, Washington, D.C., June 25, 1979 (reprinted by FEMA in April 2004). The Federal Guidelines for Dam Safety require the head of each Federal agency with responsibility for design, construction, operation, and regulation of dams to appoint a dam safety officer who reports directly to the head of the agency.

7502 - Objectives

Manage dams administered by the Forest Service to:

1. Address public health and safety concerns;
2. Protect National Forest System lands and resources; and
3. Meet land management objectives.

7503 - Policy

The Forest Service shall take necessary actions to ensure the design, construction, operation, and maintenance of Forest Service operated dams meet all acceptable standards.

7503.1 - Actions Required For Deficient Dams

Any dam with deficiencies that significantly affect the integrity of the facility must be repaired as soon as practicable or removed from service to the extent necessary to safeguard life, resources, and property until repairs are made. See FSM 2716 for direction on taking action regarding deficiencies in dams governed by a special use authorization.

If an unauthorized dam is discovered with deficiencies that threaten the integrity of the structure and that pose potential downstream hazards, take steps as soon as practicable to abate any emergency or potential for an emergency (16 U.S.C. 551). As soon as the emergency or potential for an emergency is addressed, determine whether the dam should be authorized, operated by the Forest Service, decommissioned, or breached.

7503.2 - General Considerations in Design, Construction, Operation, and Maintenance of Dams

1. Ensure that the design, construction, operation, and maintenance of Forest Service-operated dams and dams operated by the holder of a special use authorization meet acceptable standards.
2. Use facilities maintenance funds or funding for deferred maintenance for technical work related to dams operated by the Forest Service. Use landownership management funding for administration of dams operated by the holder of a special use authorization.
3. Do not relieve the holder of a special use authorization for a dam from the responsibility for ensuring its safety.
4. Do not duplicate reviews of a dam performed by State or other Federal agencies or an engineer retained by the holder of a special use authorization for a dam if those reviews meet Forest Service objectives and standards.
5. Coordinate with the local special uses staff to ensure that a special use authorization is in place for all dams that are under the jurisdiction of but are not operated by the Forest Service.

7504 - Responsibility

7504.1 - Chief

The Chief is responsible for appointing the national Dam Safety Officer for the Forest Service. This authority may be delegated to the Washington Office, Director of Engineering.

7504.2 - Washington Office, Director of Engineering

The Washington Office, Director of Engineering is responsible for:

1. Advising the Chief of the adequacy of administrative and technical procedures for managing dams.
2. Updating, periodically, the Chief on compliance with dam objectives through reports, such as the Biennial Report on Dam Safety provided to FEMA.
3. Representing the Forest Service in interagency coordination within USDA on matters pertaining to dams.
4. Establishing policy, standards, and criteria for dams:
 - a. To address public health and safety concerns.

- b. To provide for consistency with generally accepted engineering standards and practices in the design, construction, operation, and maintenance of dams.
- c. To provide for correction or mitigation of identified deficiencies in dams and duplication of successful practices regarding dams.

7504.3 - Dam Safety Officers

Dam safety officers are responsible for:

1. Establishing procedures for conducting dam safety activities for the Forest Service.
2. Coordinating as appropriate Forest Service-wide engineering aspects of dam safety activities with other administrative units; Federal, State, and local governmental agencies; and organizations.
3. Monitoring and evaluating regional administrative, technical, and regulatory practices concerning design, construction, operation, maintenance, and decommissioning of dams and preparation for and response to dam emergencies.

7504.4 - Regional Foresters

Regional foresters are responsible for:

1. Maintaining an inventory of dams operated by the Forest Service in their region.
2. Coordinating and executing agreements with regional offices of Federal, State, and local governmental agencies that own or regulate dams in their region.
3. Prior to their implementation, reviewing and certifying the acceptability of emergency action plans (EAPs), designs, and safety evaluations for dams in their region.
4. Monitoring and reporting on the quality and effectiveness of administration and technical oversight of dams in their region.
5. Providing training and assistance in preparing, maintaining, and testing emergency action plans (EAPs) by Forest Service and permit holder personnel.
6. Developing regional policy as required to address regionally specific dam safety issues inadequately addressed in the FSM 7500.

The responsibilities in FSM 7504.4, paragraphs 3, 4, and 5, may be delegated to the regional Director of Engineering.

7504.5 - Regional Directors of Engineering

Regional directors of Engineering are responsible for:

Guidance documents lack the force and effect of law, unless expressly authorized by statute or incorporated into a contract. USDA may not cite, use, or rely on any guidance that is not available through their guidance portal, except to establish historical facts.

Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

1. Reviewing and approving dam safety evaluation reports.
2. Reviewing and approving designs for dams to be operated by the Forest Service. Design approval authority for dams with a low hazard potential classification may be delegated to forest supervisors.
3. Reviewing and approving designs for dams to be operated by the holder of a special use authorization, including checking for compliance with Forest Service construction standards and criteria per approved plans and specifications.
4. Approving variances from dam design criteria that are uncovered during site investigations (FSM 7526.4).
5. Approving use of geotextiles in dams (FSM 7526.44).
6. Approving schedules for reservoir drawdowns and variances from design requirements for outlet works (FSM 7726.45). Drawdown schedule and design variance approval authority for dams with a low hazard potential classification may be delegated to forest supervisors.
7. Approving use of flashboards in spillways (FSM 7526.46).
8. Certifying in writing that newly constructed dams are acceptable for use for their intended purposes (FSM 7533.4).

7504.6 - Forest Supervisors

Forest supervisors are responsible for:

1. Requiring that operation and maintenance of dams by the Forest Service or by the holder of a special use authorization conform to the Federal Guidelines for Dam Safety (FSM 7504) and other applicable requirements and standards.
2. Designating a qualified engineer to provide technical oversight of construction, operation, inspection, and management of dams operated by the Forest Service.
3. Ensuring that a qualified engineer or authorized officer provide oversight for operation and maintenance of dams operated by the holder of a special use authorization (FSM 7513.31).
4. Ensuring that all dams are inspected at designated intervals by a qualified engineer.
5. As soon as practicable, addressing all dam safety deficiencies identified during inspections that pose a threat to human life or property and, when these deficiencies cannot be addressed promptly, requiring that operational actions be taken to reduce risk to human life and property, such as imposing reservoir restrictions, closing administrative

Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

and recreational facilities located within the dam inundation zone, draining the reservoir, or dam removal.

7. Ensuring that emergency action plans (EAPs) are prepared and maintained, that appropriate personnel are trained to implement EAPs, and that EAPs are tested at designated intervals, per FSM 7515.
8. Maintaining records pertaining to dams (FSM 7513).

7505 - Definitions

Congressionally Withdrawn Water Project. A water project authorized by Federal law under the jurisdiction of the Bureau of Reclamation, the Corps, or FERC.

Dam. Any artificial barrier, including appurtenant works, that impounds or diverts water, either temporarily or long term. Examples include:

1. **Afterbay Dam.** See the definition for “regulating dam.”
2. **Ambursen Dam.** A buttress dam of which the upstream portion is a relatively thin, flat slab usually made of reinforced concrete.
3. **Arch Dam.** A concrete, masonry, or timber dam with the alignment curved upstream so as to transmit the major part of the water load to the abutments.
4. **Buttress Dam.** A dam consisting of a watertight portion supported at intervals on the downstream side by a series of buttresses that can take many forms, such as a flat slab or massive head buttress.
5. **Crib Dam.** A gravity dam built of boxes, crossed timbers, or gabions filled with earth or rock.
6. **Diversion Dam.** A dam built to divert water from a waterway or stream into another watercourse.
7. **Double Curvature Arch Dam.** An arch dam that is curved both vertically and horizontally.
8. **Earth Dam.** An embankment dam in which more than 50 percent of the total volume is formed of compacted earth layers that are generally less than 3 inches high.
9. **Embankment Dam.** Any dam constructed of excavated natural materials, such as an earth or a rock fill dam, or of industrial waste materials, such as a mine tailings dam.
10. **Gravity Dam.** A dam constructed of concrete or masonry that relies on its weight and internal strength for stability.

Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

11. Hollow Gravity Dam. A dam with a concrete or masonry exterior and a hollow interior that relies on its weight for stability.
12. Hydraulic Fill Dam. An earth dam constructed of materials, often dredged, that are conveyed suspended in flowing water.
13. Industrial Waste Dam. An embankment dam, usually built in stages, to create storage for the disposal of waste products from an industrial process, which are conveyed as fine material suspended in flowing water to the reservoir impounded by the embankment, which is typically built of conventional materials but sometimes incorporates suitable waste products.
14. Masonry Dam. Any dam constructed mainly of stone, brick, or concrete blocks pointed with mortar, as opposed to a dam with only a masonry facing.
15. Mine Tailings Dam. An industrial waste dam for which the waste materials come from mining operations or mineral processing.
16. Multiple Arch Dam. A buttress dam consisting of a series of arches for the upstream face.
17. Overflow Dam. A dam designed to be overtopped.
18. Regulating Dam. A dam impounding a reservoir from which water is released to regulate the flow downstream.
19. Rock Fill Dam. An embankment dam more than 50 percent of which consists of compacted or dumped cobbles, boulders, rock fragments, or quarried rock generally larger than 3 inches in diameter.
20. Roller-Compacted Concrete Dam. A concrete gravity dam constructed by the use of a dry mix concrete transported by conventional construction equipment and compacted by rolling, usually with vibratory rollers.
21. Rubble Dam. A stone masonry dam in which the stones are unshaped or uncoursed.
22. Saddle Dam or Dike. A subsidiary dam of any type constructed across a saddle or low point on the perimeter of a reservoir.
23. Tailings Dam. See the definition for “mine tailings dam.”

Dam Failure. Catastrophic failure characterized by the sudden, rapid, and uncontrolled release of impounded water or the likelihood of such an uncontrolled release.

Dam Height. The vertical dimension measured from the elevation of the lowest point of the natural surface of the ground or, if excavated below the natural surface of the ground,

Forest Service Manual 7500 – Water Storage And Transmission
Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

from the invert of the outlet pipe, where the low point occurs along the longitudinal centerline of the dam, up to the spillway crest of the emergency spillway (FSM 7525.49).

Ditch Bill Easement. An easement issued under 43 U.S.C. 1761(c)(1).

Downstream Toe. The lowest point on the dam on the downstream face.

Emergency Action Plan. A document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to minimize property damage and loss of life should a failure occur, including:

1. Actions the owner of the dam must take to moderate or alleviate problems at the dam;
2. Procedures and information regarding issuance of early warning and notification of an emergency to responsible emergency management authorities; and
3. Inundation maps displaying critical areas for action by responsible emergency management authorities in case of an emergency (see FEMA Publication 64).

Fetch. The-straight-line distance across a body of water subject to wind forces that is one of the factors used in calculating wave heights in a reservoir.

Flashboard. A structural component made of timber, concrete, or steel that is placed in a channel or at the crest of a spillway to raise the reservoir level and that is intended to be quickly removed or tripped or to fail in the event of a flood.

Flood. A temporary rise in water surface elevation resulting in inundation of areas not normally covered by water and that may be expressed in terms of an average annual exceedance probability or expressed as a fraction of the probable maximum flood or other type of flood used for reference.

1. Safety Evaluation Flood. The largest flood for which the safety of a dam and its appurtenant structures is to be evaluated.
2. Inflow Design Flood. The flood flow above which the incremental increase in downstream water surface elevation due to failure of a dam is no longer considered to present an unacceptable threat to downstream life or property and which is used in the design of a dam and its appurtenant works, particularly for sizing the spillway and outlet works and determining maximum storage, dam height, and freeboard requirements.
3. Probable Maximum Flood. The flood that may be expected from the most severe combination of meteorological and hydrological conditions that are reasonably possible in the drainage basin under study.

Flood Plain. An area adjoining a body of water or natural stream that may be covered by floodwater or the downstream area that would be inundated or otherwise affected by the

Forest Service Manual 7500 – Water Storage And Transmission
Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

failure of a dam or large flood flows and that is generally delineated by the frequency or magnitude of flooding.

Flood Routing. A process of determining progressively over time the amplitude of a flood wave as it moves past a dam or downstream to successive points along a river or stream.

Flood Storage. The retention of water or delay of runoff either by planned operation, as in a reservoir, or by temporary filling of overflow areas, as in the progression of a flood wave through a natural stream channel.

Geosynthetic. Any synthetic engineering material used in conjunction with soil, foundations, or rock for purposes of drainage, filtration, separation of materials, reinforcement, moisture barriers, or erosion protection.

Geotextile. Any natural or synthetic fabric or textile used as an engineering material in conjunction with soil, foundations, or rock for purposes of drainage, filtration, separation of materials, reinforcement, moisture barriers, and erosion protection.

Hazard. A situation that creates the potential for adverse consequences such as loss of life, property damage, or other adverse impacts.

Hazard Assessment. An analysis conducted to determine the potential consequences of failure of a dam or its appurtenant structures and that is utilized to determine the hazard potential and hazard potential classification for a dam.

Hazard Potential. The possible adverse incremental consequences from failure or misoperation of a dam or its appurtenances, in a specified area downstream of a dam from flood waters released through spillways and outlet works of the dam, or released by partial or complete failure of the dam, as well as in a specified area upstream of the dam from backwater flooding or landslides around the reservoir perimeter.

Hazard Potential Classification. A system that categorizes dams according to the degree of adverse incremental consequences from their failure or misoperation, that does not reflect in any way on their current condition (that is, their safety, structural integrity, or flood routing capacity), and that includes the following categories:

1. Low. A classification that includes dams whose failure, malfunction, or misoperation would result in no probable loss of human life and minor damages limited to undeveloped or agricultural lands and for which significant improvements are not planned in the foreseeable future.
2. Significant. A classification that includes dams whose failure, malfunction, or misoperation would result in no probable loss of human life but could cause economic loss, disruption of lifeline facilities, or other significant impacts and would result in non-recoverable environmental damage.

Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

3. High. A classification that includes dams whose failure, malfunction, or misoperation would result in a probable loss of human life.

Headrace. A water course or channel directing water into the spillway or outlet works.

Hydraulic Grade Line. In hydrological terms, a line whose plotted ordinate position represents the sum of pressure head and elevation head for the various positions along a given flow path, such as along a pipeline or a ground water streamline.

Hydraulic Height. The vertical difference between the maximum pool elevation achieved during the inflow design flood and the lowest point in the original streambed.

Invert Elevation. The elevation of the lowest point in a water transmission structure (a spillway or pipe) that controls the onset of flow through that structure (the pool elevation must exceed the invert elevation for water to flow in the structure).

Lifeline Facility. A transportation system (for example, a highway, a principal arterial road, a railway, an airport, a port, or a harbor) or a utility system (for example, an electrical power plant, a gas or liquid fuel pipeline, a telecommunications system, or a water supply or waste water treatment facility).

Maximum Water Storage Elevation. The water surface elevation that is commensurate with the maximum impounding capacity of a dam, including temporary storage of flood water; that is typically established at the lowest point along the crest of the dam; and that controls the magnitude of the inflow design flood.

Non-Recoverable Damage. Resource damage that cannot be remediated, restored, or rehabilitated in a time frame comparable to the recovery period after natural disasters such as wildfires, floods, and landslides that cause similar resource damage.

Normal Freeboard. The vertical distance between the primary spillway invert and the top of a dam.

Normal Pool. The pool that is achieved when the surface elevation of impounded water equals the normal storage elevation.

Normal Storage. The storage space, measured in acre-feet, in a reservoir as measured from the normal storage elevation.

Normal Storage Elevation. The invert elevation of the lowest uncontrolled spillway.

Outlet Works. A device used to release and regulate water flow from a dam, usually consisting of one or more pipes or tunnels through the embankment of the dam with valves and gates that direct water, usually under high pressure, to a river downstream of the dam.

Forest Service Manual 7500 – Water Storage And Transmission
Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

Penstock. A pipeline or pressure shaft leading from a dam's headrace or reservoir to turbines or a sluice or floodgate controlling the discharge of water.

Pre-FLPMA Right-of-Way. A right-of-way over National Forest System lands granted under Revised Statute (R.S.) 2339; R.S. 2340; the Forest Reserve Act of 1891 (16 U.S.C. 471); the Act of May 14, 1896 (43 U.S.C. 957); the Organic Act of 1897 (16 U.S.C. 551); the Act of February 15, 1901 (16 U.S.C. 522; 43 U.S.C. 959); or the Transfer Act of 1905 (16 U.S.C. 472, 554).

Qualified Engineer. An engineer authorized to practice dam engineering, either by professional registration under State law or by employment by a Federal or State agency.

Residual Freeboard. The vertical distance between the maximum water surface of a reservoir during a flood and the top of a dam.

Risk. A measure of the likelihood and severity of adverse consequences that is determined by calculating the product of the estimated probability of an occurrence, such as a flood, dam break, or earthquake, and the numerical representation of its consequences.

Risk Analysis. Identification and quantification of risks by establishing potential failure modes, providing numerical estimates of the likelihood of an event in a specified time frame, and estimating the magnitude of the consequences, which in the context of dams should include all potential events that would cause unintentional release of water from the reservoir.

Risk Assessment. Determination of whether risks identified during risk analysis are tolerable and existing risk control measures are adequate and if not, whether alternative risk control measures are justified.

River Basin. The entire geographical area drained by a river and its tributaries, where all runoff is conveyed to the same outlet.

Seepage. Movement of water through the dam, the foundation, or the abutments.

Seiche. An oscillating wave in a reservoir caused by a landslide into the reservoir, earthquake-induced ground accelerations, fault offset, or a meteorological event.

Siphon. A closed conduit that rises above or, if inverted, that drops below the hydraulic grade line and that utilizes atmospheric pressure to control the flow of water through the conduit.

Slope Protection. The protection of a slope against wave action or erosion, for example, by using riprap.

Spillway. A structure over or through which flow is discharged from a reservoir, including:

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Forest Service Manual 7500 – Water Storage And Transmission

Zero Code

Amendment: 7500-2011-1

Effective date: May 13, 2011

1. Auxiliary Spillway. Any secondary spillway that is designed to be operated infrequently, possibly in anticipation of some degree of structural damage or erosion to the spillway that would occur during operation.
2. Controlled Spillway. A spillway over or through which the rate of flow is controlled by mechanical means, such as gates.
3. Emergency Spillway. See the definition for “auxiliary spillway.”
4. Service or Principal Spillway. A spillway that is designed to provide continuous or frequent regulated or unregulated releases from a reservoir, without significant damage to either the dam or its appurtenant structures.
5. Uncontrolled Spillway. A spillway over or through which the rate of flow is controlled only by geometry.

Spillway Capacity. The maximum spillway outflow that a dam can safely pass with the reservoir at its maximum level.

Spillway Channel. An open channel or closed conduit conveying water from the spillway inlet downstream.

Spillway Invert or Crest. The lowest elevation at the entrance to a spillway.

Stage. The elevation of the reservoir surface as measured on a stage gage.

Still Water Level. The elevation that a water surface would assume if all wave actions were absent.

Stilling Basin. A basin constructed to dissipate the energy of rapidly flowing water, for example, from a spillway or outlet, and to protect the riverbed from erosion.

Stop Logs. Large logs, timbers, or steel beams placed on top of each other with their ends held in guides on each side of a channel or conduit.

Storage. The retention of water or delay of runoff by planned operation, as in a reservoir, or by temporary filling of overflow areas, as in the progression of a flood wave through a natural stream channel including:

1. Active Storage. The volume of a reservoir that is available for use, such as power generation, irrigation, flood control, or water supply.
2. Bottom Elevation. The minimum operating level for a reservoir.
3. Dead Storage or Conservation Pool. The storage that lies below the invert of the lowest outlet and cannot readily be withdrawn from the reservoir and that is reserved for habitat preservation, sustenance of fisheries, or similar uses.

**Forest Service Manual 7500 – Water Storage And Transmission
Zero Code**

Amendment: 7500-2011-1

Effective date: May 13, 2011

4. Design Water Level. The maximum pool elevation achieved during the inflow design flood.
5. Flood Surcharge. The storage volume of a reservoir between the top of the active storage and the design water level.
6. Inactive Storage. The storage volume of a reservoir between the crest of the invert of the lowest outlet and the bottom elevation.
7. Live Storage. The sum of the active and inactive storage.
8. Maximum Storage Capacity. The total storage space, measured in acre-feet, in a reservoir at its maximum water storage elevation, including its capacity to store flood waters above its normal storage elevation.
9. Reservoir Capacity. The sum of the dead and live storage.

7506 - Jurisdictional Dams

Jurisdictional dam is defined by statutes and rules as Forest Service operated dams and dams operated by the holder of a special use authorization that meet one or more of the following criteria:

1. Dams with a high hazard potential classification;
2. Dams with a significant hazard potential classification; and
3. Dams with a low or undetermined hazard potential classification that:
 - a. Equal or exceed 25 feet in height and exceed 15 acre-feet in storage, or
 - b. Exceed 6 feet in height and equal or exceed 50 acre-feet in storage.

Dams meeting one or more of the criteria must be placed under FSM 7500 direction.

Appurtenant works are included in jurisdiction.

A jurisdictional dam does not pertain to any barrier for the purpose of storing liquid-borne material (for example mine tailings, erosion debris).

7507 - References

1. Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners (FEMA 64). April 2004. Washington, D.C. 40p, updated at <http://www.fema.gov/plan/prevent/damfailure/fema64.shtm>

2. Federal Guidelines for Dam Safety: Earthquake Analyses and Design of Dams (FEMA 65). May 2005. Washington, D.C. 75p.

**Forest Service Manual 7500 – Water Storage And Transmission
Zero Code**

Amendment: 7500-2011-1

Effective date: May 13, 2011

3. Federal Guidelines for Dam Safety (FEMA 93). April 2004. Washington, D.C. 63p.
4. Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow Design Floods for Dams (FEMA 94). April 2004. Washington, D.C. 58p.
5. Federal Guidelines for Dam Safety: Glossary of Terms (FEMA 148). April 2004. Washington, D.C. 28p.
6. Federal Guidelines for Dam Safety: Hazard Potential Classification System of Dams (FEMA 333). April 2004. Washington, D.C. 21p.
7. Design of Small Canal Structures. U.S. Department of the Interior, Bureau of Reclamation (revised reprint, latest ed.). U.S. Government Printing Office. 407p.
8. EPA Technical Report, Design and Evaluation of Tailings Dams, EPA 530-R-94-038.
9. State of Idaho Rules for Tailings Dams 37.03.05.

7509 - Handbooks

7509.1 - Servicewide Handbooks

7509.11 - Dam Management Handbook

This handbook contains direction on evaluation of special use applications for dams, as well as guidance on management of dams operated by the Forest Service and dams operated by the holder of a special use authorization on National Forest System lands.