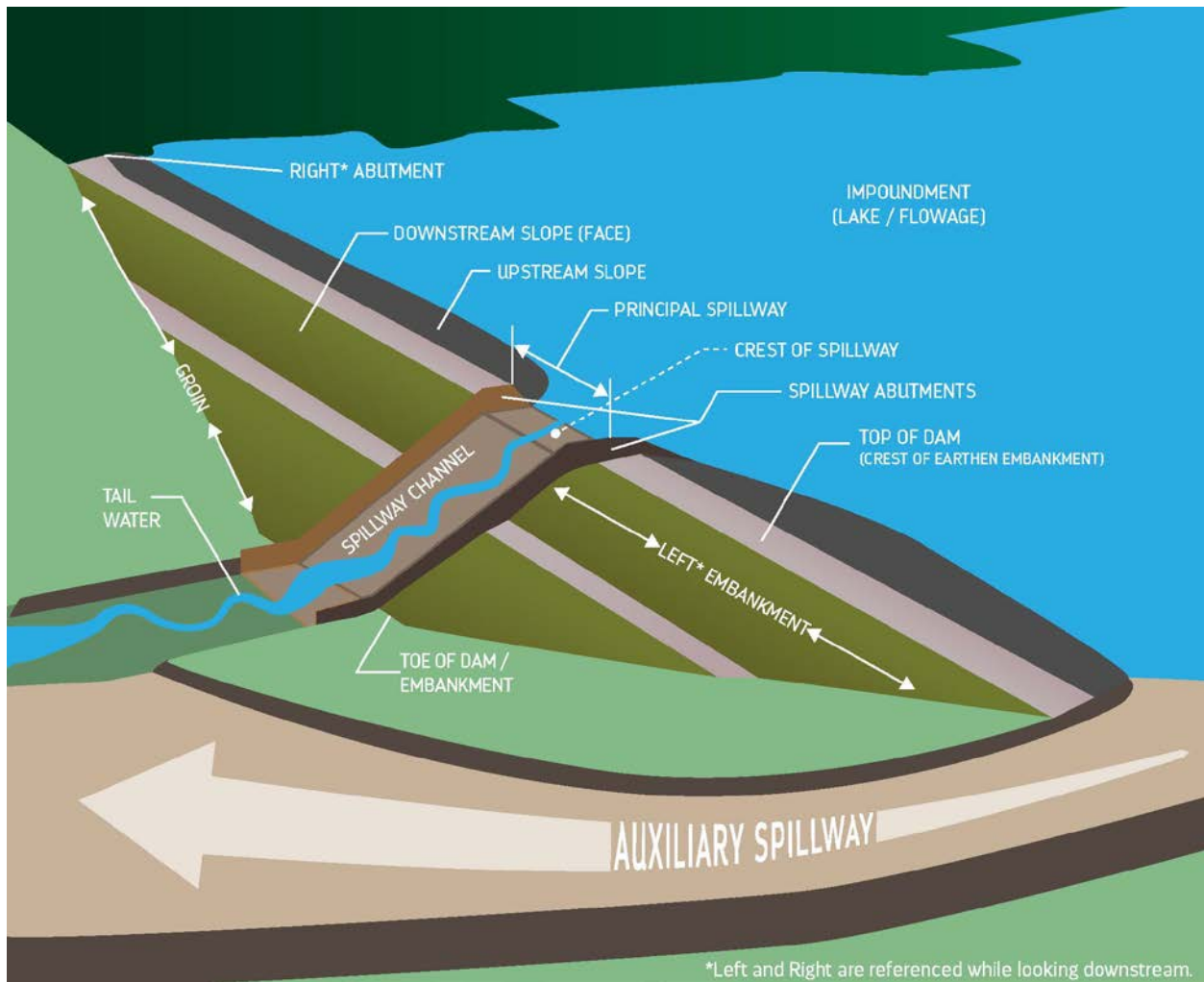


GLOSSARY OF TERMS FOR DAMS



Abutment – That part of the valley side or concrete walls against which the dam is constructed. An artificial abutment is sometimes constructed where there is no suitable natural abutment. The wall between a spillway or gate structure and the embankment can also be referred to as an abutment. (Also see Spillway Abutment)

Alterations – Changes in the design or configuration of the dam that may affect the integrity or operation of the dam and thereby have a potential to affect the safety of persons, property, or natural resources. (Also see Reconstruction)

Appurtenant Works – Structures or machinery auxiliary to dams which are built for operation and maintenance purposes (e.g., outlet works, spillway, powerhouse, tunnels, etc.).

Auxiliary Spillway (Emergency Spillway) – A secondary spillway designed to operate only during large flood events; an auxiliary gate is a standby or reserve gate only used when the normal means to control water are not available or at capacity.

Boil – An upward disturbance in the surface layer of soil caused by water escaping under pressure from behind or under a dam or a levee. The boil may be accompanied by deposition of soil particles (usually silt) in the form of a ring around the area where the water escapes.

Breach – An opening or a breakthrough of a dam sometimes caused by rapid erosion of a section of earth embankment by water; dams can be breached intentionally to render them incapable of impounding water.

Capacity (Hydraulic Capacity) – Amount of water a dam can convey through designed spillway structures, typically expressed in cubic feet per second (cfs).

Conduit – Closed channel (e.g., pipe) to convey the discharge of water through or under a dam.

Core/Corewall – Vertical zone of material of low permeability (e.g., compacted clay) typically in the center of an embankment dam to prevent seepage.

Crest of Dam (Top of Dam) – The top of the dam not designed to flow water; also known as the top of dam.

Crest of Spillway – The top of the spillway where water flows over.

Cutoff Wall – A wall of impervious material (e.g., concrete, asphaltic concrete, steel sheet piling) built into the foundation to reduce seepage through the dam.

Dam – Artificial barrier built for impounding or diverting the flow of water; see NR 333.03(3).

Dam Failure Analysis (DFA) – Analysis completed by an engineer/consultant to estimate the downstream impact if the dam were to fail during a 100-year event; results of analysis used to assign hazard rating. (Also see Hydraulic Shadow Map)

Design Spillway Capacity – The largest storm event or flowrate that a given dam/project is designed to pass safely. The inflow hydrograph (graph showing how inflow to an impoundment changes over time) is used to estimate the amount of water that the spillway needs to convey and maximum water surface elevation of the impoundment.

Dike (Levee/Berm) – An embankment built to protect land from flooding; no water control structure present.

Drain, Layer, or Filter Blanket – A layer of pervious material in a dam to facilitate controlled drainage and reduce seepage velocities; includes toe drain, weepholes, chimney drains, etc.

Drainage Area – The area that drains naturally to a specified point on a river/stream.

Drawdown – Intentional lowering of water surface level due to a controlled release of water from an impoundment; maximum drawdown rate is typically no more than 6 inches per day.

Embankment – A constructed bank of material, commonly earth or rock, to hold back water.

Embankment Dam (Earth Dam/Earthfill Dam) – Any dam primarily constructed of excavated natural materials, usually earth or rock, with sloping sides and a designated water control structure.

Emergency Action Plan (EAP) – A predetermined plan of action to be taken to reduce the potential for property damage and loss of life associated with a dam emergency or failure; EAP includes details specific to each dam.

Energy Dissipater – Device constructed within or at the outlet of a spillway to reduce energy of fast-flowing water.

Engineer/Consultant – Licensed or registered professional engineer (PE) in a given state; offers experience and expertise in the design and inspection of dams.

Face – Upstream or downstream side slope of dam.

Failure – Incident resulting in an uncontrolled release of water from a dam.

Flashboards – Boards, often constructed of wood or steel, used for increasing the depth of water behind a dam that are designed to deploy (break away) at a designed height of water.

Foundation of Dam – Natural material on which the dam structure is placed.

Freeboard – Vertical distance between the upstream water level (headwater) and the top of a dam.

Gate – Device which can be operated across the waterway to control or stop the flow. Common types of gates include slide (sluice), split-leaf, crest, and tainter (radial).

Gravity Dam – Dam constructed of concrete and/or masonry that relies on its weight for stability.

Groin – Area along the contact (or intersection) of the face of a dam with the abutments.

Headwater – Water surface elevation of the impoundment on the upstream side of the dam.

Height of Dam (Structural Height) – Difference in elevation between the point of lowest elevation on the top of the dam before overtopping and the lowest elevation of the natural stream or lake bed at the downstream toe of the dam; see NR 333.03(24).

Hydraulic Height – Difference in elevation between the headwater and tailwater.

Hydraulic Shadow Map – Map delineating the area that would be inundated due to a dam failure during a 100-year flood event; see NR 333.03(8).

Impoundment (Pool/Lake/Reservoir) – Water held back by a dam; water on the upstream side of the dam.

Intake – Any structure in an impoundment which water can be drawn through the dam.

Maintenance – The upkeep necessary for efficient operation and safety of dam and appurtenance works; involves labor and materials but is not to be confused with alterations or repairs.

Ogee Spillway (Ogee Section) – A weir where the spillway crest, slope, and bottom form an "S" or ogee curve.

One percent (1%)/One Hundred Year (100-year)/Regional Flood The regional flood is based upon a statistical analysis of stream flow records available for the watershed or an analysis of rainfall or runoff characteristics in the watershed or both. In any given year, there is a 1% chance that the regional flood may occur or be exceeded.; see NR 333.03(23).

Operator – The owner, designated agent, or employee of the owner charged with overseeing and physically operating the dam.

Outlet – An opening through which water discharges from an impoundment.

Overtopping – Uncontrolled release of water over parts of the dam that are not designed to pass flow; overtopping does not necessarily mean that the dam has failed.

Owner – A person, or group of people (e.g., Lake District), utility, corporation who is responsible for operating, maintaining, and managing a dam.

Phreatic Surface – Upper surface of saturation in an embankment.

Piping – The progressive development of internal erosion by seepage; appears on the downstream side of the dam as a hole or seam where water containing soil particles is discharged.

Plunge Pool (Stilling Basin) – A natural or sometimes artificially created pool that dissipates the energy of free-flowing water.

Primary Spillway (Principal Spillway) – Main spillway designed to convey water during normal flows; see NR 333.03(16).

Reconstruction – Altering an existing dam in a way that affects its hydraulic capacity or structural integrity; see NR 333.03(22).

Repair – Activity to restore a dam to its approved design condition.

Riprap – Large stones placed to protect against wave action, ice action and scour.

Scarp – Nearly vertical, exposed earth surface created at the upper edge of a slide or a breach.

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

Slide – Movement of a mass of earth fill down a slope along the failure plane for a considerable distance. In embankments and abutments, this involves a surficial separation of a portion of the slope from the surrounding material.

Slump – A portion of earth embankment which moves downslope, often along a curved surface; sometimes happens suddenly, often with cracks developing.

Spillway – Structure over or through which flows are discharged. If the flow and level are controlled by gates it is considered a controlled spillway, but if the spillway crest is at a fixed elevation (and cannot be changed) it is considered an uncontrolled spillway.

Spillway Abutment – Wall between a spillway or gate structure and the embankment.

Spillway Channel – Channel conveying water from the impoundment to the river downstream.

Stop Log – Logs, timbers, steel beams, or concrete beams placed on top of each other with their ends held in channels/guides/brackets on each side of a channel or conduit; stop logs may be added or removed to raise or lower the impoundment water level.

Storage – Volume of water held behind a dam, typically expressed in units of acre-feet. Maximum storage capacity means the volume of water stored before overtopping occurs; see NR 333.03(11).

Tailwater – The level of water in the discharge channel immediately downstream of the dam.

Toe Drain – Drains installed at the toe of the dam to collect and convey seepage that occurs through embankment.

Toe of Dam (Toe of Embankment) – The junction of the downstream face of a dam with the ground surface, also referred to as the downstream toe. For an embankment dam, the junction of the upstream face with the ground surface is called the upstream toe.

Trash Rack – Metal or concrete bars located in the waterway across the upstream end of a conduit or spillway channel to prevent the entry of floating or submerged debris.

Valve – Device fitted to a conduit in which the closure member is either rotated or moved transversely or longitudinally in the waterway to control or stop the flow.

Weir –A barrier built across the width of a stream to raise the upstream water level; called a fixed-crest weir; when top is at a permanent elevation and cannot be moved up or down. Weirs can also be built across a stream, channel or discharge point to measure or gauge flow. Types of weirs include broad crested, sharp crested, ogee, and V-notched weirs.