Graduate Certificate in Dam Engineering

Legal and Regulatory Frameworks for Dams

Legal and Regulatory Frameworks for Dams Glossary

A

1. Abatement: The reduction or elimination of a nuisance or violation. In the context of dam engineering, abatement may refer to actions taken to reduce the impact of dam construction or operation on the environment or surrounding communities.

2. Access Rights: The legal right to enter and use a property for a specific purpose, such as conducting inspections or maintenance on a dam. Access rights are typically defined in easement agreements or other legal documents.

3. Accreditation: The process by which an organization or individual is officially recognized as meeting certain standards or qualifications. In the context of dam safety, accreditation may be required for engineers or other professionals responsible for designing, constructing, or inspecting dams.

4. Adjudication: The legal process of resolving disputes or determining rights and obligations. Adjudication may be used to settle conflicts related to water rights, land ownership, or other issues that affect dam projects.

5. Administrative Law: The body of law that governs the activities of government agencies and their interactions with the public. Administrative law may include regulations related to dam safety, environmental protection, and other aspects of dam construction and operation.

6. Adverse Possession: A legal doctrine that allows a person to gain ownership of property through continuous and open use over a specified period of time. Adverse possession may affect the rights of dam owners or operators to access or use certain lands.

7. Altered Flow Regime: Changes in the natural flow of a river or stream caused by the construction of a dam. An altered flow regime can have significant impacts on aquatic ecosystems, water quality, and other aspects of the environment.

8. Annual Operating Plan: A detailed schedule of activities and procedures for operating a dam over the course of a year. The annual operating plan may include water release schedules, maintenance activities, emergency response procedures, and other important information.

9. Appropriation Doctrine: A legal principle that governs the allocation of water rights based on the "first in time, first in right" rule. The appropriation doctrine may affect the rights of dam owners to divert or use water from a river or stream.

10. Arbitration: A method of resolving disputes outside of court by submitting them to a neutral third party

for a binding decision. Arbitration may be used to settle conflicts between dam owners, government agencies, or other parties involved in dam projects.

B

11. Benefit-Cost Analysis: A method of evaluating the economic feasibility of a dam project by comparing the costs of construction and operation with the benefits of flood control, water supply, hydropower generation, and other potential outcomes.

12. Bid Bond: A form of security provided by a contractor as part of the bidding process for a dam construction project. The bid bond guarantees that the contractor will enter into a contract if selected and will provide a performance bond.

13. Biological Assessment: An evaluation of the potential impacts of a dam project on plant and animal species, habitats, and ecosystems. A biological assessment may be required as part of the environmental review process for dam construction or operation.

14. Buffer Zone: An area of land surrounding a dam or reservoir that is set aside for protection and conservation purposes. Buffer zones may be established to limit development, prevent erosion, or maintain water quality.

15. Bypass Reach: A section of a river or stream that is designed to allow fish and other aquatic organisms to bypass a dam. Bypass reaches may include fish ladders, fish screens, or other structures that facilitate the movement of fish past the dam.

16. Byway: A designated scenic or historic route that provides public access to natural and cultural attractions. Byways may pass near or through dam sites, offering visitors an opportunity to learn about the history and significance of the area.

C

17. Capacity Building: The process of developing the knowledge, skills, and resources needed to effectively plan, design, construct, and operate dams. Capacity building may involve training programs, technical assistance, and other forms of support.

18. Certificate of Appropriation: A legal document issued by a state or local water authority granting the holder the right to use a specified quantity of water from a river or stream. A certificate of appropriation is typically required for dam owners to obtain water rights.

19. Certification: The process by which an individual or organization is recognized as meeting specific qualifications or standards. Certification may be required for dam safety inspectors, construction contractors, or other professionals involved in dam projects.

20. Claim: A legal demand or assertion of a right to property, compensation, or other benefits. Claims may arise in the context of dam projects related to land acquisition, water rights, environmental impacts, or other issues.

21. Climate Change Adaptation: The process of adjusting to the impacts of climate change, such as changes in temperature, precipitation, and extreme weather events. Climate change adaptation may be necessary to ensure the resilience of dams and other infrastructure.

22. Collaborative Planning: A participatory approach to decision-making that involves stakeholders from diverse backgrounds in the planning and design of dam projects. Collaborative planning aims to foster consensus, build trust, and address the needs of all parties involved.

23. Compensation: Payment or other benefits provided to individuals or communities affected by a dam project. Compensation may be required for land acquisition, resettlement, environmental mitigation, or other impacts of dam construction and operation.

24. Compliance: The act of adhering to laws, regulations, standards, or other requirements. Compliance with dam safety regulations, environmental laws, and other legal frameworks is essential to ensure the safe and sustainable operation of dams.

25. Conflict Resolution: The process of resolving disagreements or disputes between parties involved in a dam project. Conflict resolution may involve negotiation, mediation, arbitration, or other methods of finding a mutually acceptable solution.

26. Conservation Easement: A legal agreement that restricts the use of land to protect its natural, scenic, or cultural values. Conservation easements may be used to preserve areas surrounding dams or reservoirs for wildlife habitat, recreation, or other purposes.

27. Construction Permit: Authorization granted by a regulatory agency to begin construction of a dam or other structure. A construction permit may be required to ensure that the project complies with safety, environmental, and other legal requirements.

28. Contingency Plan: A document outlining procedures for responding to emergencies, accidents, or unexpected events at a dam site. Contingency plans may address risks such as floods, earthquakes, dam failures, or other threats to public safety.

29. Contractor: A person or company hired to perform construction, maintenance, or other services related to a dam project. Contractors may be responsible for building the dam, conducting inspections, or providing specialized expertise.

30. Corps of Engineers: A branch of the U.S. Army responsible for engineering, construction, and environmental management projects. The Corps of Engineers plays a key role in dam construction, flood control, navigation, and other water-related activities.

D

31. Dam: A structure built across a river or stream to impound water for various purposes, such as flood control, irrigation, water supply, hydropower generation, or recreation. Dams may be made of concrete, earth, rock, or other materials.

32. Dam Break Analysis: A study of the potential consequences of a dam failure, including flood inundation, property damage, and loss of life. Dam break analysis is used to assess the risks associated with dam safety and emergency preparedness.

33. Dam Failure: The complete or partial collapse of a dam, resulting in the uncontrolled release of water downstream. Dam failures can lead to catastrophic flooding, property destruction, and loss of life.

34. Dam Safety: The set of policies, regulations, and practices designed to ensure the safe operation of dams and minimize the risks of dam failures. Dam safety programs may include inspections, monitoring, maintenance, and emergency response planning.

35. Dam Safety Officer: An individual responsible for overseeing the operation, maintenance, and inspection of a dam to ensure compliance with safety regulations. The dam safety officer plays a key role in identifying and addressing potential risks to dam stability.

36. Debris Basin: A structure designed to capture and retain sediment, rocks, vegetation, and other debris carried by runoff or floodwaters. Debris basins help to reduce the risk of debris flows, erosion, and sedimentation downstream of a dam.

37. Decommissioning: The process of permanently shutting down and removing a dam that is no longer needed or safe. Decommissioning may involve draining the reservoir, dismantling the dam structure, restoring the river channel, and addressing environmental impacts.

38. Defender: A person or organization that advocates for the protection of natural resources, cultural heritage, or public interests related to dams. Defenders may work to ensure that dam projects are designed, constructed, and operated in a sustainable and responsible manner.

39. Design Flood: The maximum flood event for which a dam is designed to safely pass or control. The design flood is typically based on historical flood data, hydrological modeling, and risk analysis to ensure the dam can withstand extreme conditions.

40. Discharge Permit: Authorization granted by a regulatory agency to release water from a dam into a river or stream. A discharge permit may be required to ensure that water quality standards are met and that downstream ecosystems are protected.

41. Displacement: The forced relocation of people or communities from their homes or lands due to dam construction or operation. Displacement may occur as a result of reservoir inundation, land acquisition, or other impacts of dam projects.

42. Downstream: The direction in which water flows away from a dam site, typically toward the lower reaches of a river or stream. Downstream areas may be affected by dam operations, water releases, sediment transport, and other factors.

43. Due Diligence: The careful and thorough investigation of risks, liabilities, and other factors related to a dam project before making decisions or taking action. Due diligence helps to identify potential issues and ensure that appropriate measures are taken to address them.

44. Duty to Warn: The legal obligation of dam owners or operators to notify downstream communities of potential flood risks, dam failures, or other emergencies. The duty to warn may involve developing emergency response plans, conducting public outreach, and providing timely information.

E

45. Easement: A legal right to use or access a property owned by another party for a specific purpose. Easements may be granted for dam construction, maintenance, access roads, transmission lines, or other activities that benefit the dam owner.

46. Ecological Flow: The quantity, timing, and quality of water needed to sustain healthy aquatic ecosystems and species. Ecological flows are essential for maintaining biodiversity, water quality, and other ecosystem functions in rivers impacted by dams.

47. Ecosystem Services: The benefits provided by natural ecosystems to human society, such as clean water, flood control, habitat for wildlife, and recreational opportunities. Ecosystem services may be affected by dam construction, operation, and other human activities.

48. Eminent Domain: The legal authority of government agencies to take private property for public use, with payment of just compensation to the property owner. Eminent domain may be used to acquire land for dam projects, roads, utilities, or other public infrastructure.

49. Emergency Action Plan: A document outlining procedures for responding to dam emergencies, such as floods, earthquakes, or structural failures. Emergency action plans are designed to protect public safety, property, and the environment in the event of a dam incident.

50. Emergency Preparedness: The process of planning, training, and coordinating resources to respond effectively to dam emergencies. Emergency preparedness measures may include drills, exercises, communication systems, and coordination with local authorities.

51. Endangered Species Act (ESA): A federal law that protects endangered and threatened species and their habitats. The ESA may require dam owners to consult with wildlife agencies, conduct biological assessments, and implement measures to avoid harm to protected species.

52. Environmental Impact Assessment (EIA): A process for evaluating the potential environmental effects of a proposed dam project. An environmental impact assessment may include studies of water quality, wildlife habitat, air quality, cultural resources, and other factors.

53. Environmental Management Plan: A document outlining measures to minimize and mitigate the environmental impacts of a dam project. An environmental management plan may include erosion control, habitat restoration, pollution prevention, and other strategies to protect the environment.

54. Environmental Protection Agency (EPA): A federal agency responsible for regulating air and water quality, hazardous waste, and other environmental issues. The EPA may set standards for dam construction, operation, and maintenance to protect human health and the environment.

55. Environmental Review: The process of evaluating the potential environmental impacts of a dam project and considering alternatives to minimize harm. An environmental review may be required under federal, state, or local laws before permits are issued for dam construction.

56. Equitable Sharing: The fair distribution of benefits, costs, and risks among stakeholders affected by a dam project. Equitable sharing aims to ensure that all parties receive a fair and just outcome from the project, taking into account their interests and needs.

57. Erosion Control: Measures to prevent or reduce the erosion of soil, rock, or sediment caused by water flow, wind, or other forces. Erosion control is important for maintaining the stability of dam structures, reservoir shorelines, and downstream channels.

58. Evacuation Route: A designated path for people to safely leave an area in the event of a dam emergency. Evacuation routes may be identified on maps, signs, and public information materials to guide residents to safety during floods, dam failures, or other disasters.

59. Exclusion Zone: A restricted area around a dam or other hazardous site where access is limited or prohibited to protect public safety. Exclusion zones may be marked with signs, fences, or other barriers to prevent unauthorized entry.

60. Expert Witness: A person with specialized knowledge, training, or experience who provides testimony in legal proceedings related to dam projects. Expert witnesses may be called upon to explain technical issues, assess damages, or offer opinions on professional standards.

F

61. Federal Energy Regulatory Commission (FERC): A federal agency responsible for regulating the construction, operation, and safety of hydropower projects in the United States. FERC issues licenses, permits, and approvals for dam projects that generate electricity from water.

62. Fish Passage: The movement of fish and other aquatic organisms past a dam or other barrier in a river or stream. Fish passage facilities, such as fish ladders, fish lifts, and bypass channels, help to restore connectivity and protect fish populations.

63. Flood Control: Measures to reduce the risk of flooding and protect people, property, and infrastructure from floodwaters. Flood control may involve the construction of dams, levees, floodwalls, detention basins, and other structures to manage river flows.

64. Floodplain: The flat or low-lying area adjacent to a river or stream that is subject to periodic flooding. Floodplains play a vital role in storing floodwaters, maintaining water quality, and providing habitat for plants, animals, and aquatic species.

65. Flow Regulation: The control of water releases from a dam to manage river flows, water levels, and downstream conditions. Flow regulation is important for flood control, water supply, hydropower generation, navigation, and other purposes served by dams.

66. Freeboard: The vertical distance between the water level in a dam reservoir and the top of the dam structure. Freeboard provides a safety margin to prevent overtopping, wave action, or other factors that could compromise the stability of the dam.

67. Full Reservoir Level (FRL): The maximum water level that a dam reservoir can reach before spilling over the dam crest. The full reservoir level is typically determined by the dam design, flood capacity, and operational requirements of the project.

68. Funding Mechanisms: Methods for financing dam projects, such as government grants, loans, bonds, user fees, or public-private partnerships. Funding mechanisms may vary depending on the type of dam, its purpose, the stakeholders involved, and the economic conditions.

69. Future Development: Potential changes in land use, population growth, climate conditions, or other factors that could affect the design, operation, or safety of a dam project in the future. Future development considerations are important for long-term planning and risk assessment.

G

70. Gate Operation: The opening, closing, and adjustment of gates in a dam to control water releases, reservoir levels, and river flows. Gate operation is essential for managing flood events, hydropower generation, irrigation, and other functions of the dam.

71. Geotechnical Investigation: A study of the soil, rock, and other geological conditions at a dam site to assess stability, seepage, and other factors that could affect dam performance. Geotechnical investigations help engineers design safe and reliable dam structures.

72. Global Positioning System (GPS): A satellite-based navigation system that provides accurate location information for surveying, mapping, and monitoring dam sites. GPS technology is used to track dam movements, measure water levels, and collect data for engineering analysis.

73. Good Engineering Practice: The application of sound engineering principles, standards, and methods to design, construction, operation, and maintenance of dams. Good engineering practice ensures that dams are built to high quality, safety, and performance standards.

74. Groundwater Recharge: The process of replenishing underground aquifers with water from surface sources, such as rivers, lakes, or precipitation. Groundwater recharge is important for maintaining water supplies, ecosystems, and water quality downstream of dams.

75. Guidelines: Standards, criteria, or recommendations