

## DEPARTMENT OF NATURAL RESOURCES

### Colorado Water Conservation Board

## RULES AND REGULATIONS FOR REGULATORY FLOODPLAINS IN COLORADO

### 2 CCR 408-1

*[Editor's Notes follow the text of the rules at the end of this CCR Document.]*

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#### **Rule 1. Title:**

The formal title of the previous Rules and Regulations was "Rules and Regulations for the Designation and Approval of Floodplains and of Storm or Floodwater Runoff Channels in Colorado" as approved in 1988. The title for these Rules and Regulations was revised in 2005 to "Rules and Regulations for Regulatory Floodplains in Colorado," and amended here under the same title (referred to herein collectively as the "Rules" or individually as "Rule"). These Rules supersede both the 2005 and the 1988 Rules.

#### **Rule 2. Authority:**

These Rules are promulgated pursuant to the authority granted the Colorado Water Conservation Board (Board or CWCB) in sections 24-4-103, 24-65.1-101(1)(c)(I), 24-65.1-202(2)(a)(I), 24-65.1-302(2)(a), 24-65.1-403(3), 30-28-111(1)–(2), 31-23-301(1)–(3), 37-60-106(1), 37-60-106(1)(c)–(g), (j), (k), C.R.S. (2010).

#### **Rule 3. Purpose and Scope:**

A. **Purpose.** The purpose of these Rules is to provide uniform standards for regulatory floodplains (or floodplains) in Colorado, to provide standards for activities that may impact regulatory floodplains in Colorado, and to stipulate the process by which floodplains will be designated and approved by the CWCB. Rules for Regulatory Floodplains are of statewide concern to the State of Colorado and the Colorado Water Conservation Board in order to prevent flooding and the negative impacts of floods, as well as to assure public health, safety, welfare and property by limiting development in floodplains. These Rules will also assist the CWCB and communities in Colorado to develop sound floodplain management practices and implement the National Flood Insurance Program (NFIP). These Rules shall apply throughout the State of Colorado, without regard to whether a community participates in the National Flood Insurance Program. These Rules shall also apply to activities conducted by state agencies and to Federal activities that are fully or partially financed by state funds. These Rules also apply to projects or studies for which the Board has made a loan or grant pursuant to sections 37-60-120(2) and 37-60-121(1)(b)(VII), (IX)(C).

#### **B. Scope**

- (1) **Zoning.** These Rules apply to all floodplain information developed for zoning and for floodplain permitting purposes for waterways in the State of Colorado by, but not limited to, individuals, corporations, local government agencies, regional government agencies, state government agencies, Indian tribes, and federal government agencies.
- (2) **Subdivisions.** These Rules generally apply to the local approval of subdivision drainage reports that provide 100-year floodplain information. Local governments should ensure that site-specific floodplain delineations, intended for regulatory purposes when they are

prepared, for development activities are consistent with floodplain information designated and approved by the Board.

- (3) **Dam Failure floodplain.** These Rules do not apply to the identification of the area potentially inundated by the catastrophic or sudden failure of any man-made structure such as a dam, canal, irrigation ditch, pipeline, or other artificial channel.

**Rule 4. Definitions:**

The following definitions are applicable to these Rules and Regulations for Regulatory Floodplain in Colorado:

<b><u>Term</u></b>	<b><u>Definition</u></b>
<b>100-year Flood</b>	A flood having a recurrence interval that has a one-percent chance of being equaled or exceeded during any given year (1-percent-annual-chance-flood). The terms "one-hundred-year flood" and "one percent chance flood" are synonymous with the term "100-year flood." The term does not imply that the flood will necessarily happen once every one hundred years.
<b>100-year Floodplain</b>	The area of land susceptible to being inundated as a result of the occurrence of a one-hundred-year flood.
<b>500-year Flood</b>	A flood having a recurrence interval that has a 0.2-percent chance of being equaled or exceeded during any given year (0.2-percent-chance-annual-flood). The term does not imply that the flood will necessarily happen once every five hundred years.
<b>500-year Floodplain</b>	The area of land susceptible to being inundated as a result of the occurrence of a five-hundred-year flood.
<b>Addition</b>	Any activity that expands the enclosed footprint or increases the horizontal square footage of an existing structure.
<b>Alluvial Fans</b>	A fan-shaped sediment deposit formed by a stream that flows from a steep mountain valley or gorge onto a plain or the junction of a tributary stream with the main stream. Alluvial fans contain active stream channels and boulder bars, and recently abandoned channels. Alluvial fans are predominantly formed by alluvial deposits and are modified by infrequent sheet flood, channel avulsions and other stream processes.
<b>Approximate Floodplain Information</b>	Floodplain information that significantly reduces the level of detail for topographic mapping or hydraulic calculations to arrive at floodplain delineations without a comparison of water surface profiles with a topographic map of compatible accuracy. The level of detail for hydrology is consistent with that of detailed floodplain information.
<b>Base Flood</b>	Is synonymous with 100-year flood and is a flood having a one percent chance of being equaled or exceeded in any given year.
<b>Base Flood Elevation (BFE)</b>	The elevation shown on a FEMA Flood Insurance Rate Map for Zones AE, AH, A1-A30, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO, V1-V30, and VE that indicates the water surface elevation resulting from a flood that has a one percent chance of equaling or exceeding that level in any given year.

<b>Basin</b>	The total land surface area from which precipitation is conveyed or carried by a stream or system of streams under the force of gravity and discharged through one or more outlets.
<b>Channel</b>	The physical confine of stream or waterway consisting of a bed and stream banks, existing in a variety of geometries.
<b>Channelization</b>	The artificial creation, enlargement or realignment of a stream channel.
<b>Code of Federal Regulations (CFR)</b>	The codification of the general and permanent Rules published in the Federal Register by the executive departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to Federal regulation.
<b>Colorado Floodplain and Stormwater Criteria Manual</b>	The Manual prepared by the CWCB to aid local officials and engineers in the proper regulation and design of flood protected facilities. The Manual is advisory, rather than regulatory, in purpose.
<b>Community</b>	Any political subdivision in the state of Colorado that has authority to adopt and enforce floodplain management regulations through zoning, including, but not limited to, cities, towns, unincorporated areas in the counties, Indian tribes and drainage and flood control districts.
<b>Conditional Letter of Map Revision (CLOMR)</b>	FEMA's comment on a proposed project, which does not revise an effective floodplain map, that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodplain.
<b>Critical Facility or Critical Facilities</b>	Means a structure or related infrastructure, but not the land on which it is situated, as specified in Rule 6, that if flooded may result in significant hazards to public health and safety or interrupt essential services and operations for the community at any time before, during and after a flood. See Rule 6.
<b>Debris Flow</b>	Movement of mud, water, and other materials downward over sloping terrain. The flow typically consists of a mixture of soil, rock, woody debris and water that flows down steep terrain.
<b>Designation and Approval</b>	Certification by formal action of the Board that technical information developed through scientific study using accepted engineering methods is suitable for local governments making land use decisions under statutorily authorized zoning powers.
<b>Detailed Floodplain Information</b>	Floodplain information prepared utilizing topographic base mapping, hydrologic analysis, and hydraulic calculations to arrive at precise water surface profiles and floodplain delineations suitable for making land use decisions under statutorily authorized zoning powers.
<b>Development</b>	Any man-made changes to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.
<b>DFIRM Database</b>	Database (usually spreadsheets containing data and analyses that accompany DFIRMs). The FEMA Mapping Specifications and Guidelines outline requirements for the development and maintenance of DFIRM databases.

<b>Digital Flood Insurance Rate Map (DFIRM)</b>	FEMA digital floodplain map. These digital maps serve as “regulatory floodplain maps” for insurance and floodplain management purposes.
<b>Federal Register</b>	The official daily publication for Rules, proposed Rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents.
<b>FEMA</b>	Federal Emergency Management Agency.
<b>FEMA Guidelines &amp; Specifications for Flood Hazard Mapping Partners</b>	Floodplain mapping specifications published by FEMA. The FEMA Guidelines and Specifications for Flood Hazard Mapping Partners (2009) are incorporated herein by reference and available for viewing at <a href="http://www.fema.gov/fhm/dl_cgs.shtm">www.fema.gov/fhm/dl_cgs.shtm</a> and for inspection at the CWCB offices at 1313 Sherman Street, Room 721, Denver CO 8020. The regulations may also be examined at any state or federal publications depository library. The FEMA Mapping Specifications and Guidelines incorporated herein by reference are only those in existence at the time of the promulgation of these Rules and Regulations for Regulatory Floodplains in Colorado and do not include later amendments to or editions of the incorporated material.
<b>"Flood" or "Flooding"</b>	<p>A general and temporary condition of partial or complete inundation of normally dry land areas from:</p> <ol style="list-style-type: none"> <li>1. The overflow of water from channels and reservoir spillways;</li> <li>2. The unusual and rapid accumulation or runoff of surface waters from any source; or</li> <li>3. Mudslides or mudflows that occur from excess surface water that is combined with mud or other debris that is sufficiently fluid so as to flow over the surface of normally dry land areas (such as earth carried by a current of water and deposited along the path of the current).</li> </ol>
<b>Flood Contour</b>	A line shown on a map joining points of equal elevation on the surface of floodwater that is perpendicular to the direction of flow.
<b>Flood Control Structure</b>	A physical structure designed and built expressly or partially for the purpose of reducing, redirecting, or guiding flood flows along a particular waterway.
<b>Flood Insurance Rate Map (FIRM)</b>	A FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community.
<b>Flood Mitigation Project</b>	A project within or adjacent to a flooding source that is specifically intended to reduce or eliminate the negative impacts caused by excessive floodwaters through improvement of drainage, flood control, flood conveyance or flood protection.
<b>Floodplain</b>	The area of land that could be inundated as a result of a flood, including the area of land over which floodwater would flow from the spillway of a reservoir.
<b>Floodplain Management</b>	The operation of an overall program of corrective and preventive measures for reducing flood damage, including, but not limited to, zoning or land-use regulations, flood control works, and emergency preparedness plans.

<b>Floodplain Management Regulations</b>	Zoning ordinances, subdivision regulations, building codes, health regulations, land-use permits, special purpose ordinances (floodplain ordinance, grading ordinance, or erosion control ordinance) and other applications of regulatory powers. The term describes state/local regulations that provide standards for flood damage preservation and reduction.
<b>Floodplain Maps</b>	Maps that show in a plan view the horizontal boundary of floods of various magnitudes or frequencies. Such maps include, but are not limited to, Flood Hazard Boundary Maps (FHBM), Flood Insurance Rate Maps (FIRM), and Digital Flood Insurance Rate Maps (DFIRM) published by FEMA, Flood Prone Area Maps published by the U.S. Geological Survey (USGS), Flooded Area Maps published by the U. S. Army Corps of Engineers (COE), Floodplain Information Reports published by the CWCB or others, Flood Hazard Area Delineations (FHAD) published by the Urban Drainage and Flood Control District (UDFCD), and other locally adopted floodplain studies and master plans.
<b>Floodplain Studies</b>	A formal presentation of the study process, results, and technical support information developed for floodplain maps.
<b>Floodway</b>	The channel of a river or other watercourse and the adjacent land areas that must be kept free of obstructions in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
<b>Foreseeable Development</b>	The potential future development of, or changes in, the land uses that are likely to take place during the period of time covered by a community's adopted master land use plan or comprehensive community plan, or if no time period is specified, over a 20-year period. If there is no adopted community plan, then potential development patterns based on zoning, annexations, and other relevant factors should be evaluated.
<b>Freeboard</b>	The vertical distance in feet above a predicted water surface elevation intended to provide a margin of safety to compensate for unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood such as debris blockage of bridge openings and the increased runoff due to urbanization of the watershed.
<b>Geographic Information Systems (G.I.S.)</b>	Computer software that utilizes databases and terrain mapping to store and display spacial and tabular data, such as floodplains, as layers (e.g. political boundaries, roadways, structures, topographic information) for natural resource management and other uses.
<b>Hydraulic analysis</b>	The determination of flood elevations and velocities for various probabilities based on a scientific analysis of the movement and behavior of floodwaters in channels and overbank areas.
<b>Hydrologic Analysis</b>	The computation of the peak rate of flow, or discharge in cubic feet per second, for various selected probabilities for streams, channels, or watersheds based on a scientific analysis of the physical process.
<b>Letter of Map Revision (LOMR)</b>	An official revision to the currently effective FEMA map. It is issued by FEMA and changes flood zones, delineations, and elevations.

<b>Letter of Map Revision Based on Fill (LOMR-F)</b>	FEMA's modification of the Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (FIRM) based on the placement of fill outside the existing regulatory floodway.
<b>Levee</b>	An artificial structure or land feature that has been designed and is operated, wholly or in part, for the purpose of containing, controlling, or diverting the flow of water.
<b>Low Impact Development (LID)</b>	Development design/construction strategy that maintains the predevelopment hydrologic regime to the extent possible. The goal of LID is to mimic the natural runoff hydrograph as much as practicable in terms of magnitude, frequency, duration, timing, and rate of change of stream flows. LID focuses on small scale stormwater retention and detention, reduced impervious areas, and increased runoff periods.
<b>Material Safety Data Sheet (MSDS)</b>	A form with data regarding the properties of a particular substance. An important component of product stewardship and workplace safety, it is intended to provide workers and emergency personnel with procedures for handling or working with that substance in a safe manner, and includes information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures.
<b>Mitigation</b>	The process of preventing disasters or reducing related hazards. Structural Mitigation, includes, but is not limited to, flood proofing structures, diverting floodwaters, detention ponds, floodwalls or levees. Nonstructural Mitigation includes, but is not limited to, education, planning, and design of flood prevention measures, emergency preparedness plans, elevating relocating structures, purchasing property for open space, or early flood warning detection systems.
<b>National Flood Insurance Program (NFIP)</b>	FEMA's program of flood insurance coverage and floodplain management administered in conjunction with the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The NFIP has applicable Federal regulations promulgated in Title 44 of the Code of Federal Regulations. The U.S. Congress established the NFIP in 1968 with the passage of the National Flood Insurance Act of 1968.
<b>Post-Wildfire Hydrology</b>	Methodologies and calculations developed to account for the increased stormwater runoff following forest fires. Post-wildfire hydrology is typically evaluated every 3 to 5 years to assess the need for further revision based on watershed recovery, forest re-growth, and other factors.
<b>Provisionally Accredited Levee (PAL)</b>	A levee that FEMA has previously credited with providing protection from a 1-percent-chance-annual-flood on an effective FIRM or DFIRM, for which FEMA is awaiting data and/or documentation that will show the Levee's compliance with Levee certification requirements of the NFIP regulations.
<b>Regulatory Floodplain</b>	Floodplain Maps, Profiles, and related information for flood hazard areas that have been designated and approved by the CWCB. See Rule 5.
<b>Residual Risk</b>	The threat to the areas behind levees that may still be at risk for flooding. Although the probability of flooding may be lower because a levee exists, the consequence to personal safety and property is much higher should a levee overtop or fail.

<b>Stream Alteration Activity</b>	Any manmade activity within a stream or floodplain that alters the natural channel, geometry, or flow characteristics of the stream.
<b>Substantial Change</b>	Any improvement to, or rehabilitation due to damage of, a structure for which the activity performed equals or exceeds 50% of the pre-improvement or pre-damaged value of the structure. The value of the structure shall be determined by the local jurisdiction having land use authority in the area of interest.
<b>Threshold Planning Quantity (TPQ)</b>	A quantity designated for each chemical on the list of extremely hazardous substances that triggers notification by facilities to the State that such facilities are subject to emergency planning requirements.
<b>Topography</b>	Configuration (relief) of the land surface elevation; the graphic delineation or portrayal of that configuration in map form, as by lines of constant elevation called contour lines.
<b>Use Change</b>	Any change in the primary use of a facility.
<b>Water Surface Profile</b>	A graph that shows the relationship between the vertical elevation of the top of the floodwater and of the streambed with the horizontal distance along the stream channel.

#### **Rule 5. Regulatory Floodplain:**

The Regulatory Floodplain in Colorado is the 100-year floodplain. However, the CWCB will Designate and Approve 500-year floodplain information but only at the written request of a local authority having land use jurisdiction. In addition, previously designated floodplain areas that have been removed from FEMA's effective regulatory floodplain by a Letter of Map Revision based on Fill (LOMR-F) shall remain within the Regulatory Floodplain for all activities affected by Rule 11(c). All Designated and Approved Regulatory Floodplain information can be used by local authorities having land use jurisdiction for the purpose of local regulation. The General Assembly has deemed the designation of floodplains a matter of statewide importance and interest and gave the CWCB the responsibility for the designation of Regulatory Floodplains and to assure protection of public health, safety, welfare and property by protecting development in the Regulatory Floodplains. § § 24-65.1-101, 24-65.1-202(2)(a)(l), 24-65.1-302(1)(b), (2)(a), 24-65.1-403(3), 24-65.1-404(3).

#### **Rule 6. Critical Facilities:**

A. **Classification:** Critical Facilities are classified under the following categories: (1) Essential Services; (2) Hazardous Materials; (3) At-risk Populations; and (4) Vital to Restoring Normal Services.

- (1) *Essential services facilities* include public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities , and transportation lifelines.

*These facilities consist of:*

- a. *Public safety (police stations, fire and rescue stations, emergency vehicle and equipment storage, and, emergency operation centers);*

- b. *Emergency medical (hospitals, ambulance service centers, urgent care centers having emergency treatment functions, and non-ambulatory surgical structures but excluding clinics, doctors offices, and non-urgent care medical structures that do not provide these functions);*
- c. *Designated emergency shelters;*
- d. *Communications (main hubs for telephone, broadcasting equipment for cable systems, satellite dish systems, cellular systems, television, radio, and other emergency warning systems, but excluding towers, poles, lines, cables, and conduits);*
- e. *Public utility plant facilities for generation and distribution ( hubs, treatment plants, substations and pumping stations for water, power and gas, but not including towers, poles, power lines, buried pipelines, transmission lines, distribution lines, and service lines); and*
- f. *Air Transportation lifelines (airports (municipal and larger), helicopter pads and structures serving emergency functions, and associated infrastructure (aviation control towers, air traffic control centers, and emergency equipment aircraft hangars).*

Specific exemptions to this category include wastewater treatment plants (WWTP), Non-Potable water treatment and distribution systems, and hydroelectric power generating plants and related appurtenances.. Owners of these facilities are encouraged to meet the spirit of Rule 6(D) when practicable in order to protect their own infrastructure and to avoid system failures during extreme flood events. Emergency restoring plans following major flood events should be considered as a prudent addition to operation and maintenance plans for those facilities.

Public utility plant facilities may be exempted if it is demonstrated to the satisfaction of the local authority having jurisdiction that the facility is an element of a redundant system for which service will not be interrupted during a flood. At a minimum, it shall be demonstrated that redundant facilities are available (either owned by the same utility or available through an intergovernmental agreement or other contract) and connected, the alternative facilities are either located outside of the 100-year floodplain or are compliant with this rule, and an operations plan is in effect that states how redundant systems will provide service to the affected area in the event of a flood. Evidence of ongoing redundancy shall be provided to the local authority on an as-needed basis upon request by that local authority.

- (2) *Hazardous materials facilities* include facilities that produce or store highly volatile, flammable, explosive, toxic and/or water-reactive materials.

*These facilities may include:*

- a. *Chemical and pharmaceutical plants (chemical plant, pharmaceutical manufacturing);*
- b. *Laboratories containing highly volatile, flammable, explosive, toxic and/or water-reactive materials;*
- c. *Refineries;*
- d. *Hazardous waste storage and disposal sites; and*



*e. Above ground gasoline or propane storage or sales centers.*

Facilities shall be determined to be Critical Facilities if they produce or store materials in excess of threshold limits. If the owner of a facility is required by the Occupational Safety and Health Administration (OSHA) to keep a Material Safety Data Sheet (MSDS) on file for any chemicals stored or used in the work place, AND the chemical(s) is stored in quantities equal to or greater than the Threshold Planning Quantity (TPQ) for that chemical, then that facility shall be considered to be a Critical Facility. The TPQ for these chemicals is: **either** 500 pounds **or** the TPQ listed (**whichever is lower**) for the 356 chemicals listed under 40 C.F.R. § 302 (2010), also known as Extremely Hazardous Substances (EHS); **or** 10,000 pounds for any other chemical. This threshold is consistent with the requirements for reportable chemicals established by the Colorado Department of Health and Environment. OSHA requirements for MSDS can be found in 29 C.F.R. § 1910 (2010). The Environmental Protection Agency (EPA) regulation "Designation, Reportable Quantities, and Notification," 40 C.F.R. § 302 (2010), *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_03/40cfr302\\_03.html](http://www.access.gpo.gov/nara/cfr/waisidx_03/40cfr302_03.html), and OSHA regulation "Occupational Safety and Health Standards," 29 C.F.R. § 1910 (2010), *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_99/29cfr1910\\_99.html](http://www.access.gpo.gov/nara/cfr/waisidx_99/29cfr1910_99.html), are incorporated herein by reference and include the regulations in existence at the time of the promulgation of these Rules, but exclude later amendments to or editions of the regulations.

Specific exemptions to this category include: a) Finished consumer products within retail centers and households containing hazardous materials intended for household use, and agricultural products intended for agricultural use. b) Buildings and other structures containing hazardous materials for which it can be demonstrated to the satisfaction of the local authority having jurisdiction by hazard assessment and certification by a qualified professional (as determined by the local jurisdiction having land use authority) that a release of the subject hazardous material does not pose a major threat to the public. c) Pharmaceutical sales, use, storage, and distribution centers that do not manufacture pharmaceutical products.

These exemptions shall not apply to buildings or other structures that also function as Critical Facilities under another category outlined in this Rule 6(A).

(3) *At-risk population facilities* include medical care, congregate care, and schools.

*These facilities consist of:*

- a. Elder care ( nursing homes);*
- b. Congregate care serving 12 or more individuals ( day care and assisted living);*
- c. Public and private schools (pre-schools, K-12 schools), before-school and after-school care serving 12 or more children);*

(4) *Facilities vital to restoring normal services* including government operations.

*These facilities consist of:*

- a. Essential government operations (public records, courts, jails, building permitting and inspection services, community administration and management, maintenance and equipment centers);*

*b. Essential structures for public colleges and universities (dormitories, offices, and classrooms only);*

These facilities may be exempted if it is demonstrated to the satisfaction of the local authority having jurisdiction that the facility is an element of a redundant system for which service will not be interrupted during a flood. At a minimum, it shall be demonstrated that redundant facilities are available (either owned by the same entity or available through an intergovernmental agreement or other contract), the alternative facilities are either located outside of the 100-year floodplain or are compliant with this rule, and an operations plan is in effect that states how redundant facilities will provide service to the affected area in the event of a flood. Evidence of ongoing redundancy shall be provided to the local authority on an as-needed basis upon request by that local authority.

- B. Identification of Critical Facilities.** It is the responsibility of the local jurisdiction having land use authority to identify and confirm that specific structures in their community meet the criteria outlined in Rule 6(A) and are deemed to be Critical Facilities. All structures that clearly meet the intent of Rule 6 shall be deemed Critical Facilities by that jurisdiction. For those structures for which it is unclear or otherwise ambiguous if the criteria are met, the local jurisdiction shall have the sole discretion to determine if the structure is a Critical Facility. Local jurisdictions may adopt ordinances that regulate to higher standards or that include additional facilities within the definition of Critical Facilities. Critical Facilities that are also designated as historic structures (determinations by the State Historic Preservation Office) are exempt from these requirements. Pursuant to section 24-65.1-202(2)(a)(I)(A), C.R.S. (2010), open space activities such as agriculture, horticulture, floriculture, recreation, and mineral extraction, including oil and gas activities, shall be encouraged in the floodplain, and are exempt as Critical Facilities unless provisions within Rule 6(A)(2) apply.

Required identification of Critical Facilities shall be limited to owner-occupied structures. Local jurisdictions may, at their sole discretion, include leased facilities in their identification of Critical Facilities.

- C. 500-year Flood Events.** The CWCB acknowledges that flooding does occur above and beyond 100-year (1% annual chance) events. Communities are encouraged to regulate development of Critical Facilities within the 500-year floodplain, when available.
- D. Protection of Critical Facilities.** All new and Substantially Changed Critical Facilities, and new Additions to Critical Facilities, shall be regulated to a higher standard than those structures not determined to be Critical Facilities. Local jurisdictions having land use authority are encouraged to consult with the owner of the Critical Facility in determining the value of the Critical Facility when a Substantial Change is being considered. This Rule 6 shall be applied to a Use Change if the new use meets the provisions within Rule 6(A). Further, although Rule 6 shall apply to new Additions made at Critical Facilities, it shall only apply to the new Additions, and not the Critical Facility to the extent the Critical Facility existed prior to the amendment of these Rules. The higher standard for Critical Facilities shall be as follows: For Critical Facilities located within the 100-Year Floodplain, the structure shall be protected according to Rule 11(B) herein, with the exception of a freeboard of two feet substituted for the standard one-foot freeboard. The *International Building Code* (2006) and *Flood Resistant Design and Construction* (ASCE 24) (2005) can be used as reference tools for this standard, but are not incorporated by reference herein.

For the purposes of this Rule 6(D), protection shall include one of the following:

- a) Location outside the Regulatory Floodplain; or
- b) Elevation or Flood-proofing of the structure so that it is protected to the level indicated in this Rule 6(D).

Unimproved lands associated with a Critical Facility that lie within a regulatory floodplain shall not be subject to this requirement, until future development takes place on those lands. Likewise, if an undeveloped portion of a facility's property lies within a Regulatory Floodplain, but the developed portion of that facility lies outside of the Regulatory Floodplain, then that facility shall not be classified as a Critical Facility. All other rules and regulations governing structures not deemed Critical Facilities remain in effect and unchanged.

- E. **Ingress and Egress for New Critical Facilities** shall, when practicable as determined by the local jurisdiction having land use authority, have continuous non-inundated access (ingress and egress for evacuation and emergency services) during a 100-year flood event. This criterion is also recommended, but not required, for changes to existing Critical Facilities and use changes involving existing structures whose classification changes to Critical Facilities.
- F. **For all Critical Facilities** , the Variance procedure outlined in Rule 15 herein remains available and may be considered when deemed necessary and appropriate by the local jurisdiction having land use authority over the Critical Facility.

**Rule 7. Standards for Delineation of Regulatory Floodplain Information:**

- A. **Intent of this Rule.** This Rule contains standards for approximate and detailed floodplains. All floodplain information intended to be used by local jurisdictions for the purpose regulating flood hazard areas, with the exception of local stormwater drainage reports, CLOMR, LOMR, and LOMR-F submittals, and supporting documentation submitted to FEMA, shall be provided to the CWCB for designation and approval in order to enable local governments to regulate floodplains appropriately. The standards in this rule reference, and incorporate herein, the FEMA Guidelines and Specifications for Flood Hazard Mapping Partners. Whenever such a reference is made, it includes the FEMA Guidelines and Specifications for Flood Hazard Mapping Partners material in existence at the time of the promulgation of these Rules, but excludes later amendments to or editions of the material.
- B. **Level of Detail.**
  - (1) Approximate Floodplain Information will be based on detailed hydrology computed for 100-year floods. Hydraulic information shall be produced using approximate, field, or limited techniques and best available topographic/survey data.
  - (2) Detailed Floodplain Information will be based on detailed hydrologic and hydraulic determinations for 100-year floods Flood profiles and floodplain delineations for 100-year flood and other frequencies, if any, shall be plotted, preferably using a digital method. The CWCB shall designate and approve 100-year floodplain information, and 500-year information but only at the request of a local authority having land use jurisdiction.
- C. **Base Mapping.** Base mapping for floodplain studies shall meet the minimum standards as set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, as incorporated herein by reference.
- D. **Topography and Surveys.** Topographic and field survey information for floodplain studies shall meet the minimum standards as set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, as incorporated herein by reference.
- E. **Geographic Information Systems (GIS).** GIS information for floodplain studies in Colorado shall meet the minimum standards as set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, as incorporated herein by reference.

- F. **Hydrology.** Hydrologic analyses for floodplain studies in Colorado shall be completed using the information set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, as incorporated herein by reference. The Colorado Floodplain and Criteria Manual may be used as a reference document to aid in this analysis. In addition, hydrology studies must comply with the following:
- (1) All floodplain studies, regardless of the level of detail, (e.g., approximate or detailed) shall utilize detailed hydrologic information. The CWCB recognizes existing and future watershed conditions for the purposes of computing flood hydrology. The CWCB may evaluate future watershed conditions, in addition to existing conditions when Foreseeable Development is expected.
  - (2) Any new study to evaluate hydrologic information and/or design storm criteria shall be completed in such a way that it is scientifically defensible and technically reproducible.
  - (3) All jurisdictions and communities affected by revised hydrologic data, due to their geographic proximity to the affected stream reach within a particular watershed, are encouraged to participate in the update process, and shall be given the opportunity by the study sponsor to review and comment on the revised information. Opponents to the revised information may present technically accurate and sound scientific data to the CWCB that clearly demonstrates that the information in question is inaccurate pursuant to Rule 12. The CWCB shall make the final determination regarding disputes.
  - (4) Within any given watershed, or hydrologic subregion, consistency in hydrologic data and runoff methodology shall be pursued to the extent possible through cooperation of all affected jurisdictions and entities.
- G. **Detailed Hydraulic Method.** Hydraulic analyses for floodplain studies in Colorado shall be completed using protocols set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, as incorporated herein by reference.
- H. **Floodplain Delineations.** Floodplain delineations shall be completed using protocols set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, as incorporated herein by reference, and shall, at a minimum, comply with the technical quality assurance standards as follows:
- (1) The flood elevations and the floodplain delineations on the maps must correlate reasonably to the best available topographic information for the stream and adjacent corridor and must meet an acceptable level of technical accuracy.
  - (2) The planimetric features on the floodplain maps (including, but not limited to, streets and highways, stream centerlines, bridges and other critical hydraulic features, corporate limits, section lines and corners, survey benchmarks) must be consistent with the best available aerial photographs or other suitable information for the stream and the adjacent corridor, as determined through prevailing industry practices, and must meet an acceptable level of technical accuracy.
- I. **Special Floodplain Conditions.** There are a number of special floodplain conditions, or natural flood hazards, in Colorado that fall outside of the standard riverine environment. Studies for the 100-year flood involving special conditions shall be completed using protocols set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, as incorporated herein by reference. The special conditions are:
- (1) Alluvial Fan and Debris Flow floodplains located within foothill and mountainous regions of Colorado shall be considered on a case-by-case basis.

- (2) Post-wildfire hydrology shall be evaluated on a case-by-case basis in forested areas immediately following moderate to intense wildfires resulting in approximately 15% or greater burn area of the affected watershed. Interim flood advisory maps, based on burned watershed conditions, shall be produced at the request of the local governing authority or by Board initiative. The interim floodplain maps shall show increased runoff from hydrophobic soils and lack of vegetation. The post-wildfire maps shall be evaluated every 3 to 5 years to assess the need for further revision based on watershed recovery, forest re-growth, and other factors.
- (3) Ice jam flooding shall be considered within stream reaches where this phenomenon is known to occur. Ice jam flooding may be analyzed utilizing methodologies available through the U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL), located in Hanover, New Hampshire.

**J. Written reports and maps.** The results of the hydrologic analyses, hydraulic analyses, and floodplain delineations shall be summarized in a written report and submitted to the CWCB. All Approximate and Detailed Floodplain Information that is presented to the CWCB for designation and approval shall be properly titled, dated, organized, and bound as a stand-alone document. In addition to the hard copy final report, the CWCB requires that a digital copy of the final report be submitted in MS Word and PDF formats. All pertinent technical backup data such as GIS files, and hydrologic and hydraulic models shall also be provided to the CWCB in acceptable digital formats. The CWCB shall electronically distribute to interested parties, to the extent possible, pertinent study information. Access to original GIS information shall be provided to local governments and other authorized users through a secure and protected website or other secure means.

- (1) The Regulatory Floodplain maps shall show, at a minimum, the flood boundaries, the location of all cross sections used in the hydraulic analysis, the reference line drawn down the center of the floodplain or low flow channel, and a sufficient number of flood contours in order to reconstruct the flood water surface profiles.
- (2) New Physical Map Revisions requested by local jurisdictions or involving local jurisdictions should include detailed 500-year floodplain information when practicable.
- (3) Flood contours, or Base Flood Elevations, shall be shown as wavy lines drawn perpendicular to the direction of flow of floodwater and shall extend completely across the area of the mapped Regulatory Floodplain. Each flood contour shall indicate its elevation to the nearest whole foot.
- (4) The Regulatory Floodplain map scale shall be 1-inch equals 1000 feet or such map scale showing greater detail. FEMA map panels may also be published at 1 inch equals 500 feet, 1 inch equals 1,000 feet or 1 inch equals 2000 feet.
- (5) Where discrepancies appear between Regulatory Floodplain maps and water surface profiles, any regulatory water surface profile designated and approved by the Board shall take precedence over any corresponding flooded area map for the same stream reach or site location, unless a profile error is identified and substantiated.

**K. Contractor Qualifications**

- (1) Qualified engineers licensed in Colorado shall direct or supervise the floodplain mapping studies and projects pertaining to the Regulatory Floodplain. All floodplain maps, reports and project designs pertaining to the Regulatory Floodplain, except those prepared by federal agencies, shall be certified and sealed by the Colorado Registered Professional Engineer of record.

- (2) Federal agencies or other recognized and qualified government authorities may produce floodplain mapping work as a study proponent or on behalf of a study proponent.

**Rule 8. Standards for Regulatory Floodways:**

- A. **Establishment of Floodway Criteria.** The CWCB recognizes that Designated Floodways are administrative limits and tools used by communities to regulate existing and future Floodplain developments within their jurisdictions. This Rule 8(A) does not require communities to automatically map ½ foot floodways within their jurisdictions. However, at such time when floodways are to be delineated through Physical Map Revisions involving local government participation, communities shall delineate floodways for the revised reaches based on ½-foot rise criteria. Letters of Map Revision to existing floodway delineations may continue to use the floodway criteria in place at the time of the existing floodway delineation. Until such time that floodways are revised and designated, communities may continue to regulate their mapped one-foot floodways. For reaches where a transition must be shown to connect new studies to existing studies with different floodway criteria, the transition length shall not exceed 2,000 feet.
- B. **Designation of floodways.** Designation and approval of Floodplain information shall also include the designation and approval of corresponding Floodway Information. For waterways with Base Flood Elevations for which Floodways are not computed, the community shall apply a ½ foot floodway regulation according to its own determination, as outlined in FEMA Regulation 44 C.F.R. § 60.3(c)(10) (2010), incorporated herein by reference, for a 1-foot floodway. This reference is *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_02/44cfr60\\_02.html](http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr60_02.html), and is hereby incorporated by reference into this Rule and includes the material in existence at the time of the promulgation of these Rules, but does not include later amendments to or editions of this incorporated material
- C. **Incorporation of FEMA’s Floodway Regulations.** All regulations defined in the FEMA regulations “Criteria for Land Management and Use,” 44 C.F.R. § 60.3(c)(10), (d) (2010) *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_02/44cfr60\\_02.html](http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr60_02.html), are hereby incorporated by reference into this Rule and includes the material in existence at the time of the promulgation of these Rules, but does not include later amendments to or editions of this incorporated material. All communities participating in the National Flood Insurance Program that have Base Flood Elevations defined for one or more of the waterways within their jurisdictions shall adopt and enforce these floodway regulations. Failure to enforce floodway regulations may impact the community’s standing in the National Flood Insurance Program and may eliminate or reduce eligibility for federal or state financial assistance for flood mitigation and disaster purposes.
- D. **Communities in Which This Rule Applies.** Communities with Regulatory Floodplains that have been Designated and Approved by the CWCB with Base Flood Elevations defined for one or more of the waterways within their jurisdictions shall be required to establish technical (quantified) surcharge criteria for floodway determination and regulation, which must meet or exceed the requirements set forth in this Rule. This Rule shall not apply in communities without Base Flood Elevations established, unless otherwise adopted by the community. This Rule shall not apply to approximate stream reaches for which Base Flood Elevations have not been defined.

**Rule 9. Criteria for Determining the Effects of Flood Control Structures on Regulatory Floodplains:**

- A. For the purposes of this Rule, local and regional hydraulic structures providing local or regional flood or stormwater detention, shall be considered to be “Flood Control Structures.” There are no separate criteria for these structures.
- B. **Flood Control Structures.** If a publicly operated and maintained structure is specifically designed and operated either in whole or in part for flood control purposes, then its effects shall be taken into consideration when delineating the floodplain below such structure. The effects of the

structure shall be based upon the 100-Year Flood with full credit given to the diminution of peak flood discharges, which would result from normal Flood Control Structure operating procedures.

The hydrologic analysis pertaining to State Regulatory Floodplains shall consider the effects of on-site detention for rooftops, parking lots, highways, road fills, railroad embankments, diversion structures, refuse embankments (including, but not limited to, solid waste disposal facilities), mill tailings, impoundments, siltation ponds, livestock water tanks, erosion control structures, or other structures, only if they have been designed and constructed with the purpose of impounding water for flood detention and are publicly operated and maintained. For the purposes of this Rule, Public operation and maintenance may include direct responsibility or ultimate responsibility through written agreement. Detention structures that are privately operated or maintained shall not be included in the hydrologic analysis unless it can be shown that they exacerbate downstream peak discharges.

- C. **Non-Flood Control Structures.** If a structure is not specifically designed and operated, either in whole or in part, for flood control purposes, then its effects, even if it provides inadvertent flood routing capabilities that reduce the 100-Year Flood downstream, shall not be taken into account, and the delineation of the Floodplain below such structure shall be based upon the 100-Year Flood that could occur absent the structure's influence. However, if adequate assurances have been obtained to preserve the flood routing capabilities of such structure, then the delineation of the Floodplain below the structure may, but need not, be based on the assumption that the reservoir formed by the structure will be filled to the elevation of the structure's emergency spillway and the 100-Year hydrology can be routed through the reservoir to account for any flood attenuation effects.
- D. **Adequate Assurances.** For the purposes of this Rule 9 "adequate assurances" shall, at a minimum, include appropriate recognition in the community's adopted master plan of: (1) the flood routing capability of the reservoir, as shown by comparison of the 100-Year Floodplain in plan and profile with and without the structure in place, in order that the public may be made aware of the potential change in level of Flood protection in the event that the reservoir flood routing capability is lost; (2) the need to preserve that flood routing capability by whatever means available in the event that the reservoir owners attempt to make changes that would decrease the flood routing capability; and (3) a complete operations and maintenance plan.
- E. **Irrigation Facilities.** The CWCB recommends that irrigation facilities (including, but not limited to, ditches and canals) not be used as stormwater or flood conveyance facilities, unless specifically approved and designated by local governing jurisdictions and approved by the irrigation facility owners. The flood conveyance capacity of irrigation facilities shall be acknowledged only by agreement between the facility owners and local governing jurisdictions, with review and concurrence from the Colorado Division of Water Resources to ensure that water rights administration needs are properly considered. A maintenance easement or agreement shall be in place allowing the local government maintenance access if needed.

Unless specified otherwise by aforementioned written agreement, flood hydrology for State Regulatory Floodplain mapping purposes shall consist of peak hydrologic flows that are identical immediately downstream and immediately upstream of a ditch or canal that is generally perpendicular to the stream or drainageway of interest. The irrigation facility shall be assumed as running full so that there are no computed flood reduction benefits downstream of the irrigation facility. Backwater behind irrigation facilities shall be mapped. The CWCB will designate and approve 100-Year Floodplain information for irrigation facilities if the above recommendations are met. This Rule is not intended in any way to interfere with Colorado water law.

#### **Rule 10. Criteria for Determining Effects of Levees on Regulatory Floodplains:**

**General.** The use of levees for property protection, flood control, and flood hazard mitigation is not encouraged by the CWCB, unless other mitigation alternatives are not viable. The areas landward of an

accredited levee and Provisionally Accredited Levee (PAL) system shall be mapped as Zone X (shaded). The Digital Flood Insurance Rate Maps (DFIRMs) for these areas will include an informational note that advises users of the flood risk in levee-impacted areas. In situations where levees are the only viable alternative for protection of existing development, "setback" levees should be designed and constructed to maintain the natural channel and reserve a portion of the natural floodplain capacity. Levees should not be used for flood protection along streams or watercourses where new development is planned. However, levees may be used to protect public utility plant facilities for wastewater treatment and pumping as well as electric power plants due to their close proximity to natural waterways. For existing levees that protect existing development, proper maintenance should be performed by levee owners/operators, or non-federal sponsors in the case of federal levees, according to an operations and maintenance plan.

Levees should not be constructed for the primary purpose of removing undeveloped lands from mapped floodplain areas for the purposes of developing those lands because of the potential impairment of the health, safety, welfare and property of the people. Design and construction of levees identified for this purpose will not be eligible for CWCB grants or loans.

When constructed, levees for which protection will be considered for designation and approval must meet the requirements set forth in "Mapping of Areas Protected by Levee Systems," 44 C.F.R. § 65.10 (2010). Artificial embankments that either function as a Levee or a Flood Control Structure must meet the provisions of this Rule or "Office of the State Engineer Rules and Regulations for Dam Safety and Dam Construction," 2 C.C.R. § 402-1 (2010), respectively, in order to be considered as providing protection. 44 C.F.R. § 65.10 (2010), *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_02/44cfr65\\_02.html](http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr65_02.html), and 2 C.C.R. § 402-1 (2010), *available at* [http://water.state.co.us/pubs/rule\\_reg/ds\\_rules07.pdf](http://water.state.co.us/pubs/rule_reg/ds_rules07.pdf), are hereby incorporated by reference and include the incorporated material in each in existence at the time of the promulgation of these Rules, but do not include later amendments to or editions of either.

- A. **Maintenance.** An Operating and Maintenance manual that ensures continuing proper function of the structure shall be prepared and updated. The levee shall be structurally sound and adequately maintained. Sedimentation effects shall be considered for all levee projects. Certification from a federal agency, state agency, or a Colorado Registered Professional Engineer that the levee meets the minimum freeboard criteria, as stated above, and that it appears, on visual inspection, to be structurally sound and adequately maintained shall be required on a three-year basis and provided to the CWCB. Levees that have obvious structural defects or that are obviously lacking in proper maintenance shall not be considered in the hydraulic analysis.
- B. **Ownership.** Privately-operated or maintained levee systems will not be considered in the hydraulic analysis performed pursuant to Rule 7 unless a local ordinance mandates operation and maintenance of the levee system and the criteria set forth below are met. Levees for which the community, State, or Federal government has responsibility for operations and maintenance will be considered, provided that the criteria set forth below are met. Privately-owned levee systems shall only be considered in the hydraulic analysis if a fully executed agreement exists between the levee owner and a governmental entity enabling unrestricted access to the governmental entity for the purposes of inspection and maintenance and gives the governmental entity responsibility for maintenance. A copy of the executed agreement shall be provided to the Board and the Board shall be notified in writing of any changes made to this agreement.
- C. **Freeboard.** A minimum levee freeboard of 3 feet shall be necessary, with an additional 1-foot of freeboard within 100 feet of either side of hydraulic structures within the levee or wherever the flow is constricted, such as at bridges. An additional 0.5-foot above this minimum is also required at the upstream end of the levee.
- D. **Interior Drainage.** In cases where levees are mapped as providing 100-year protection the adequacy of interior drainage systems, on the landward side of the levee, shall be evaluated. Areas subject to flooding from inadequate interior drainage behind levees will be mapped using standard procedures.



- E. **Human Intervention and Operation.** In general, evaluation of levees shall not consider human intervention (e.g., capping of levees by sandbagging, earth fill, or flashboards) for the purpose of increasing a levee's design level of protection during an imminent flood. Human intervention shall only be considered for the operation of closure structures (e.g., gates or stop logs) in a levee system designed to provide at least 100-year flood protection, including adequate freeboard as described above, provided that such human operation is specifically included in an emergency response plan adopted by the community.
- F. **Analysis.** For areas protected by a levee providing less than 100-year protection (e.g., 10-year protection), flood elevations shall be computed as if the levee did not exist. For the unprotected area between the levee and the source of flooding, the elevations to be shown shall be obtained from either the flood profile that would exist at the time levee overtopping begins or the profile computed as if the levee did not exist, whichever is higher. This procedure recognizes the increase in flood elevation in the unprotected area that is caused by the levee itself. This procedure may result in flood elevations being shown as several feet higher on one side of the levee than on the other. Both profiles shall be shown in the final report and labeled as "before levee overtopping" and "after levee overtopping" respectively.

#### **Rule 11. Floodplain Management Regulations:**

- A. **Compliance with Minimum Standards of the National Flood Insurance Program.** Each community in the State of Colorado shall comply with the minimum floodplain criteria set forth in the FEMA regulation "Criteria for Land Management and Use," 44 C.F.R. § § 60.3–60.5 (2010), unless more restrictive standards have been adopted as set forth in Rules 1 through 20 of these Rules and Regulations for Regulatory Floodplains in Colorado or pursuant to regulations adopted by the local community. These Rules do not apply to local stormwater or local storm drainage studies where riverine flooding sources are not considered. 44 C.F.R. § § 60.3–60.5 (2010) *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_02/44cfr60\\_02.html](http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr60_02.html), are hereby incorporated by reference and include the material in existence at the time of the promulgation of these Rules, but do not include later amendments to or editions of the material.
- B. **Minimum Freeboard.** A minimum freeboard of one foot above the 100-year flood elevation (Base Flood Elevation) shall apply to structures in the floodplain as follows:
- (1) Residential Structures. New and Substantially Changed residential structures, and Additions to existing residential structures shall be constructed with the lowest floor, including basements, placed with a minimum of one foot of freeboard above the Base Flood Elevation.
  - (2) Non-residential Structures. New and Substantially Changed non-residential structures, and Additions to existing non-residential structures shall be constructed with the lowest floor, including basements, placed with a minimum of one foot of freeboard above the Base Flood Elevation, or be flood-proofed to an elevation at least one foot above the Base Flood Elevation. Agricultural structures shall be exempt from this requirement.
- Critical Facilities shall be regulated according to Rule 6.D. This rule does not affect the freeboard requirement for levees described in Rule 10.C.
- C. **Permit Restrictions for Properties Removed from the Floodplain by Fill.** No Community shall issue a permit for the construction of a new structure on a property removed from the floodplain by the issuance of a FEMA Letter of Map Revision Based on Fill (LOMR-F) with a floor elevation placed below the base flood elevation with one foot of freeboard that existed prior to the placement of fill. Issuance of any such permit shall constitute a violation of these Rules. Critical Facilities are exempted from this restriction if the facility is protected according to Rule 6.D herein.

## **Rule 12. Effects of Flood Mitigation Measures and Stream Alteration Activities on Regulatory Floodplains:**

In order to assist the CWCB in carrying out its mission to protect the health, safety, welfare and property of the public, through the prevention of floods in Colorado, the CWCB requires the following:

- A. Detention/flood control storage and LID should be considered, when practicable, as part of a basinwide program for the watershed.
- B. Flood control channels shall include a low-flow channel with a capacity to convey the average annual flow rate, or other appropriate flow rate as determined through a hydrogeomorphological analysis, without excessive erosion or channel migration, with an adjacent overbank floodplain to convey the remainder of the 100-year flow. The channel improvement shall not cause increased velocities or erosive forces upstream or downstream of the improvement.
- C. Channelization and flow diversion projects shall appropriately consider issues of sediment transport, erosion, deposition, and channel migration and properly mitigate potential problems through the project as well as upstream and downstream of any improvement activity. A detailed geomorphological analysis should be considered, when appropriate, to assist in determining the most appropriate design.

Project proponents for a mitigation activity must evaluate the residual 100-year floodplain. Proponents are also encouraged to map the 500-year residual floodplain.

- D. All public and private Flood Control Structures shall be maintained to ensure that they retain their structural and hydraulic integrity. Annual inspections including, as appropriate, field surveys of stream cross-sections, shall demonstrate to the appropriate regulatory jurisdictions that the project features are in satisfactory structural condition, that adequate flow capacity remains available for conveying flood flows, and that no encroachment by vegetation, animals, geological processes such as erosion, deposition, or migration, or by human activity, endanger the proper function of the project. If any significant problems, as identified within annual inspection reports,, the facility or project owner shall notify the CWCB within 60 days of the inspection. The inspections shall be conducted by the local jurisdiction for all publicly owned or publicly maintained facilities, and shall be conducted by the property owner or facility owner for all privately owned and maintained facilities.
- E. Any stream alteration activity proposed by a project proponent must be evaluated for its impact on the regulatory floodplain and be in compliance with all applicable federal, state and local floodplain rules, regulations and ordinances.
- F. Any stream alteration activity shall be designed and sealed by a Colorado Registered Professional Engineer or Certified Professional Hydrologist.
- G. All activities within the regulatory floodplain performed by federal agencies using local or state funds, or by private, local or state entities shall meet all applicable federal, state and local floodplain requirements.
- H. Stream alteration activities shall not be constructed unless the project proponent demonstrates through a floodway analysis and report, sealed by a Colorado Registered Professional Engineer, that there are no adverse floodway impacts resulting from the project. This requirement only applies on stream reaches with Base Flood Elevations established.
- I. No adverse floodway impact means that there is a 0.00-foot rise in the proposed conditions compared to existing conditions floodway.

- J. Whenever a Stream Alteration activity is known or suspected to increase or decrease the established Base Flood Elevation in excess of 0.3 vertical feet (or a more stringent standard adopted by the local government authority), a Letter of Map Revision showing such changes shall be obtained in order to accurately reflect the proposed changes on FEMA's regulatory floodplain map for the stream reach. The local community is responsible for ensuring that this process is pursued. This section herein does not require a Conditional Letter of Map Revision (CLOMR) to be applied for, unless mandated by the local government having land use authority.

**Rule 13. Process for Designation and Approval of Regulatory Floodplains:**

- A. **Designation and Approval Requirements.** The Board will designate and approve Regulatory Floodplains by the adoption of written resolutions based only upon such floodplain information as the Board determines meets the standards set forth in Rule 7, as applicable, with consideration of the effects of dams and levees being subject to the criteria or Rules 9 and 10, respectively and any mitigation activity in Rule 12.
- B. **Base Flood.** 100-year floodplain information shall generally be the basis for all designation and approval actions by the Board for regulatory purposes in Colorado. However, the CWCB will designate and approve 500-year floodplain information but only at the written request of a local authority having land use jurisdiction.
- C. **Provisional Designation.** The CWCB may designate and approve, on a provisional basis and for a maximum period of time not to exceed two years, floodplain information that does not meet the minimum requirements as set forth in Rule 7.
- D. **Process for Taking Designation and Approval Actions.** The Board shall consider the designation and approval of floodplain information either by request of a community or by acting on its own initiative.
- (1) **Consideration at a Community's Request.** The Board shall consider designation and approval of floodplain information upon written request from the governing body of any community having jurisdiction in the area where the floodplain information is applicable. The letter of request shall identify the report title, date, author or agency which prepared the report, stream name(s), upstream and downstream limits of the stream reach(es) to be designated, stream length(s) in miles, type of designation requested (detailed or approximate), and any other relevant information. The Board shall receive such a request at least 30 days prior to the Board meeting at which consideration of designation and approval is requested.
- (2) **Consideration at the Board's initiative.** If designation and approval of a floodplain would be in the best interest of the health, safety, welfare and property of the citizens of the State of Colorado, then the Board may take action at its own initiative to consider the designation and approval of floodplain information. In such cases, the Board shall notify the affected communities in writing at the time of study initiation or, in the case of a previously completed study, the Board shall receive concurrence in writing from the affected community at least 45 days prior to the Board meeting at which it will consider the designation and approval of floodplain information within their jurisdiction.
- (3) **Notification of Adopted Resolutions.** The CWCB shall send signed copies of each adopted resolution of designation and approval to the applicable local legislative bodies of each community having jurisdiction over land-use decisions in the study area and to FEMA within 30 days of adoption.

**Rule 14. Designation and Approval of Changes to Regulatory Floodplains:**

When changes are made to the characteristics of a floodplain that result in a revision of a community's Flood Insurance Rate Maps or Flood Hazard Boundary Maps (and a subsequent designation of the new map), the Board will designate and approve changes to the regulatory floodplain caused by development, new or better technical information, or other sources. The CWCB will designate the changed floodplains by adopting written resolutions based upon such floodplain information as the Board determines meets the standards set forth in Rules 6-12. In the event that a community is aware of and has access to better available information on a previously designated flooding source, then the CWCB allows for that undesignated information to be used for regulatory purposes.

- A. **Conditions.** All changes to designated floodplains shall meet the same conditions as those required for original approval and designation.
- B. **Process for Designation and Approval of Changes to a Regulatory Floodplain.** The Board may consider the designation and approval of floodplain information either by request of a community or by acting on its own initiative.
  - (1) **Consideration at a Community's Request.** The Board shall consider designation and approval of changes to a regulatory floodplain upon written request from the governing body of any community having jurisdiction in the area where the floodplain information is applicable. The Board staff shall receive such requests at least 30 calendar days prior to the Board meeting at which consideration of designation and approval is requested.
  - (2) **Consideration at the Board's Initiative.** If designation and approval of a floodplain would be in the best interest of the health, safety, welfare and property of the citizens of the State of Colorado, then the Board may take action at its own initiative to consider the designation and approval of floodplain information. In such cases, the Board shall notify the affected communities in writing at the time of the study initiation or, in the case of a previously completed study, the Board shall receive concurrence in writing from the affected community at least 45 days prior to the Board meeting at which it will consider the designation and approval of floodplain information within their jurisdiction.
  - (3) **Notification of Adopted Resolution.** The CWCB shall send signed copies of each adopted resolution of designation and approval of changes to a regulatory floodplain to the applicable local legislative bodies of each community having jurisdiction over land-use decisions within the limits of the changed floodplain within 30 calendar days of designation and approval.
- C. **Identification of Designations of Changes to a Regulatory Floodplain.** The designation of the changes to the regulatory floodplain will be given a reference identification number that will differentiate the changed designation from the original. It is implied that designations to changes to a regulatory floodplain will only rescind the affected portions of the previously designated floodplain information. All other unaffected reaches will remain as originally designated.
- D. **Map Revisions to Flood Insurance Rate Maps or Flood Hazard Boundary Maps.** Floodplain map revisions (e.g., FEMA Letters of Map Revision) will be designated twice annually by the CWCB during a regularly scheduled Board meeting and will not be subject to a full technical review by the CWCB staff.

**Rule 15. Variances:**

- A. **Consideration by local jurisdiction.** Request for a variance to any of these Rules may be considered by the local jurisdiction having land use authority, provided the entity or individual requesting the variance has submitted a written request to the appropriate authority. A notice of the Request must be provided to any adjacent communities that would be affected by the variance.

**B. Contents of a Request for Variance.** The request for a variance shall identify:

- (1) The Rule from which the variance is requested;
- (2) The communities that would be affected by the variance;
- (3) The reasons why the Rule cannot be complied with;
- (4) The estimated difference in water surface elevations, flood velocities and flood boundaries that would result if the requested variance were granted than if the calculations were made through strict compliance with the Rule;
- (5) The estimated number of people and structures that will be impacted by granting of the variance; and
- (6) Any other evidence submitted by the community, the CWCB staff, or other party of interest.

**C. Factors to be considered.** Variances may be issued if it can be determined that:

- (1) There is a good and sufficient cause; and
- (2) The variance is the minimum necessary, considering the flood hazard, to afford relief; and
- (3) Failure to grant the variance would result in exceptional hardship to the community or the requestor and that the hardship is not the community's or requestor's own making; and
- (4) The granting of a variance will not result in increased vulnerability to flood losses, additional threats to public safety and welfare, extraordinary public expense, create nuisances, cause fraud or victimization of the public, hide information of significant interest to the public or conflict with existing local laws or regulations.
- (5) In lieu of items C(1) through C(4) above, a local jurisdiction having land use authority may, at its sole discretion, use an established variance procedure.

**D. Variance Process.** Variance requests shall be processed as follows:

- (1) Local jurisdictions having land use authority shall render, confirm, modify, or reject all variance requests pertaining to these Rules.
- (2) The Board may review local variance decisions on a case-by-case basis to ensure that the overall intent and spirit of these Rules are properly considered at the local level.
- (3) Informal variance determination request may be presented to CWCB staff in order to guide community officials or project applicants as to whether a formal variance would be needed on a case by case basis.

## **Rule 16. Enforcement of Floodplain Rules and Regulations:**

**A. Procedure to be followed regarding alleged violations**

(1) **Notice of Non-Compliance.**

- a. A Notice of Non-Compliance (NONC) may be prepared and transmitted by the CWCB or its Director. Information regarding potential violations may be discovered directly by CWCB staff or can be brought to the CWCB or its Director by a

Complainant, such as the Federal Emergency Management Agency, other state agencies, the local government within whose boundaries the alleged violation took place, or by any other person who may be directly and adversely affected or aggrieved as a result of the alleged violation.

- b. Oral complaints shall be confirmed in writing by the Complainant. Persons making a complaint are required to submit a formal letter of complaint to the CWCB Director.
- c. NONC process.
  - i. An NONC issued by the CWCB shall be delivered to an alleged violator by personal delivery or by certified mail (return receipt requested). A copy of the NONC shall be transmitted to FEMA Region VIII and the local jurisdiction having land use authority.
  - ii. The NONC does not constitute final agency action.
  - iii. The NONC shall identify the statute, Rule, regulation, or policy subject to CWCB jurisdiction allegedly violated and the facts alleged to constitute the violation. The NONC may propose appropriate corrective action and suggested corrective action(s) if any, that the CWCB elects to require.

(2) FEMA Region VIII shall support, through its National Flood Insurance Program activities, these Rules. This support will include the existing ability for FEMA to place sanctions upon a community for non-compliance.

(3) Certain CWCB decisions to provide flood and watershed related grant funding to communities may be directly dependent upon a community's compliance with these Rules.

#### **Rule 17. Incorporation by Reference:**

FEMA Regulations 44 C.F.R. § § 59, 60, 65, and 70 (2010), *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_00/44cfrv1\\_00.html](http://www.access.gpo.gov/nara/cfr/waisidx_00/44cfrv1_00.html), EPA Regulations 40 CFR § 302 (2010), *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_03/40cfr302\\_03.html](http://www.access.gpo.gov/nara/cfr/waisidx_03/40cfr302_03.html), and OSHA Regulations 29 CFR § 1910 (2010), *available at* [http://www.access.gpo.gov/nara/cfr/waisidx\\_99/29cfr1910\\_99.html](http://www.access.gpo.gov/nara/cfr/waisidx_99/29cfr1910_99.html), are incorporated herein by reference. In addition, The Colorado "Office of the State Engineer Rules and Regulations for Dam Safety and Dam Construction Materials," set forth in 2 C.C.R. § 402-1 (2010), *available at* [http://water.state.co.us/pubs/rule\\_reg/ds\\_rules07.pdf](http://water.state.co.us/pubs/rule_reg/ds_rules07.pdf), are incorporated herein by reference. The FEMA Guidelines and Specifications for Flood Mapping Partners (2009), *available at* [www.fema.gov/fhm/dl\\_cgs.shtm](http://www.fema.gov/fhm/dl_cgs.shtm), are also incorporated herein by reference. These regulations are hereby incorporated by reference by the Colorado Water Conservation Board and made a part of these Rules and Regulations for Regulatory Floodplains in Colorado. Materials in these Rules, including, but not limited to those mentioned here in Rule 17, which are incorporated by reference are those materials in existence as of the effective date of these Rules and do not include later amendments to or editions of these materials. The material incorporated by reference is available for public inspection during regular business hours at the Colorado Water Conservation Board, 1313 Sherman Street, Room 721, Denver, CO 80203 or may be examined at any state or federal publications depository library, or on the FEMA or CWCB website.

#### **Rule 18. Severability:**

If any portion of these Rules is found to be invalid, the remaining portion of the Rules shall remain in force and in effect.

### **Rule 19. Recommended Activities for Regulatory Floodplains:**

The following list contains floodplain management activities and actions suggested by the CWCB to increase a community's overall level of flood protection. Communities and other authorized government entities may:

- A. Adopt local standards above and beyond the FEMA and CWCB minimum requirements.
- B. Develop a Flood Response Plan that identifies responsibilities/actions before, during and after a flood event.
- C. Enroll in FEMA's National Flood Insurance Program (NFIP) and possibly FEMA's Community Rating System (CRS) Program.
- D. Develop an early warning flood detection system (flood warning system) using available technologies such as automated precipitation and stream flow gages linked to an appropriate notification system.
- E. Coordinate with lenders, insurance agents, real estate agents, and developers to prepare and discuss educational tools based on state and federal requirements.
- F. Promote wise floodplain development and support effective structural and non-structural flood mitigation projects.
- G. Conduct floodplain studies in areas of Foreseeable Development that do not currently have detailed floodplain studies.
- H. Maintain an electronic or paper library of local flood related data.
- I. Develop a flood risk outreach program and notify flood prone residents annually of flood hazards and the need for flood insurance.
- J. Encourage elevation of flood-prone structures and flood-proofing of structures in the floodplains.
- K. Utilize available state/federal mitigation and preparedness funds.
- L. Require certified floodplain managers to review proposed land developments.
- M. Advise the public at large that flooding does occur above and beyond the 100-year and 500-year floods. Floods greater than 500-year floods do occur, and loss of life and property is possible in areas mapped outside of both the 100-year and 500-year floodplains.
- N. Utilize the concept of "No Adverse Impact" floodplain management where the action of one property owner does not adversely impact the rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation. No Adverse Impact could be extended to entire watersheds as a means to promote the use of retention/detention or other techniques to mitigate increased runoff from urban areas.
- O. Prohibit the construction of new levees that are intended to remove land from a regulatory floodplain for the purpose of allowing new development activity to take place in areas that are otherwise flood prone.
- P. Require an appropriate level of freeboard at bridges between the 100-year water surface elevation and the lowest elevation of the lowest structural member to allow for passage of waterborne debris.

- Q. Identify areas prone to flooding outside of the 500-year floodplain where loss of life or substantial property damage may occur. Flooding greater than 500-year (0.2% chance) events can and do occur as well, and loss of life and property is possible in areas mapped outside of both the 100-year and 500-year regulatory floodplains. Communities are encouraged to map and regulate 500-year floodplains for Critical Facilities at their sole discretion.
- R. Maintain a flood hazard page on the community website with links to the CWCB, FEMA Flood Map Store, National Flood Insurance Program, National Weather Service, local building codes, and local permitting information.
- S. The CWCB discourages Compensatory Flood Storage because existing flood storage volume should be preserved. However, when necessary, structures and fill that displace floodplain storage volume shall be compensated for by excavation of equivalent volumes at equivalent elevations within a nearby vicinity of the displaced volume. The compensatory storage area shall be hydraulically connected to the source of flooding.
- T. Adopt Buffer Ordinances that limit development in and near natural protective features such as riparian stream corridors and wetlands. Natural protective features may extend beyond 100 year flood elevations. Extra protections for these areas are beneficial because these areas attenuate runoff periods, improve water quality, stabilize streambanks, recharge groundwater aquifers, allow for lateral stream migration, and protect aquatic and terrestrial habitat. Riparian and wetland areas also enhance the general aesthetic value of a community.
- U. Buffer ordinances are often seen as part of land use or zoning code. They may also stand alone in other portions of the municipal code. Options for widths include fixed width, variable width, or multi-zoned buffers.
- V. Establish Residual Risk Mapping. Residual Risk is the threat to the areas behind levees that may still be at risk for flooding. FEMA has identified thousands of miles of levees nationwide, affecting millions of people. It is important for levee owners, communities, and homeowners to understand the risks associated with living in levee-impacted areas and the steps that can be taken to provide full protection from flooding. Even the best flood protection system or structure cannot completely eliminate the risk of every flood event, and when levee systems fail, the results may be catastrophic and the damage may be more significant than if the levee system had not been built.

**Rule 20. Effective Date:**

These Rules shall apply to the designation and approval of all floodplain information made by the Board and all other floodplain activities on or after January 14, 2011 and are, therefore, not retroactive to any floodplain information designated and approved by the Board or other floodplain activities prior to the effective date. These Rules contain provisions that will require many local ordinances to be updated to be consistent with these rules. A transition period of three years beginning from the effective date of these rules will be in effect during which all local governments may follow current local ordinances but must undertake activities to come into compliance with these Rules. Following this transition period, all floodplain activities shall be in conformance with these Rules. In addition, communities may, at their sole discretion, allow un-built projects that were previously permitted by the local government, prior to the adoption date of the local ordinance for which these Rules are incorporated, to be built and therefore considered to be in compliance with these Rules. Communities may also, at their sole discretion, permit and allow projects for which a valid CLOMR was issued prior to the adoption date of the local ordinance for which these Rules are incorporated.

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**Editor's Notes**



## **History**

Entire rule eff. 01/14/2011.