

DEPARTMENT OF NATURAL RESOURCES

Colorado Water Conservation Board

RULES AND REGULATIONS FOR REGULATORY FLOODPLAINS IN COLORADO

2 CCR 408-1

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 the 2010, 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, 24-65.1-101(1)(c), 24-65.1-202(2)(a), 24-65.1-302(2)(a), 24-65.1-403(3), 37-60-106(1), 37-60-106(1)(c)–(g), (j), (k), and 37-60-108, C.R.S..

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 define the process by which floodplains will be Designated and Approved by the Board. Rules for Regulatory Floodplains are of statewide concern to the State of Colorado and the Board in order to prevent Flooding and the negative impacts of Floods, as well as to promote public health, safety, welfare and property by limiting Development in Floodplains. These Rules also assist the CWCB and Communities in Colorado to develop sound Floodplain Management practices and implement the 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 Stream Alteration Activities conducted by state agencies and to federal Stream Alteration 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), C.R.S.
- 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, Native American 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:

| <u>Term</u> | <u>Definition</u> |
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| 100-Year-Flood | A Flood having a recurrence interval that has a 1-percent-annual-chance of being equaled or exceeded during any given year (1-percent-annual-chance-Flood). For the purpose of these Rules, the terms "100-Year-Flood" "1-percent -annual-chance Flood," and "base Flood," are synonymous. The term does not imply that the Flood will necessarily happen once every one hundred years. |
| 100-Year-Floodplain | The area of land susceptible to being inundated as a result of the occurrence of a 100-Year-Flood. 100-Year-Floodplains are considered to be areas of high Flood hazard. For the purposes of these Rules, the terms "100-Year-Floodplain," "Regulatory Floodplain," and "Special Flood Hazard Area" are synonymous. |
| 500-Year-Flood | A Flood having a recurrence interval that has a 0.2-percent-annual-chance of being equaled or exceeded during any given year (0.2-percent- annual-chance-Flood). The terms "five-hundred-year Flood" and "0.2-percent -annual-chance Flood" are synonymous with the term "500-Year-Flood." The term does not imply that the Flood will necessarily happen once every five hundred years. |
| 500-Year-Floodplain | The area of land susceptible to being inundated as a result of the occurrence of a 500-year-Flood. 500-Year-Floodplains are typically considered to be areas of moderate Flood hazard. |
| Accessory Structure | A structure which is on the same parcel of property as a principal structure and the use of which is incidental to the use of the principal structure. |
| Addition | Any activity that expands the enclosed footprint or increases the horizontal square footage of an existing structure. |
| Agricultural Structure | For Floodplain Management Regulation purposes, Agricultural Structures are structures that are used exclusively for agricultural purposes or uses in connection with the production, harvesting, storage, raising, or drying of agricultural commodities and livestock. |

Structures used for human habitation and those that are places of employment or entertainment and structures with multiple or mixed purposes do not satisfy the “exclusive use” requirement and are not Agricultural Structures.

Alluvial Fans

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.

Approximate Floodplain Information

Flood hazard information based on a reduced level of detail for topographic mapping or hydraulic calculations. Analysis results may be used to develop Flood hazard delineations and corresponding data (i.e., water surface elevations, associated depths and velocities). This may or may not have 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. Base Flood Elevations are often not portrayed on a mapped stream reach with Approximate Floodplain Information.

Base Flood

Is synonymous with 100-Year-Flood and is a Flood having a 1-percent-annual-chance of being equaled or exceeded in any given year.

Base Flood Elevation (BFE)

The elevation shown on a FEMA FIRM 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 1-percent-annual-chance of equaling or exceeding that level in any given year.

Basin

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.

Board

Refers to the Board of Directors of the Colorado Water Conservation Board.

Channel

The physical confine of stream or waterway consisting of a bed and stream banks, existing in a variety of geometries.

Channelization

The artificial creation, enlargement or realignment of a stream Channel.

Code of Federal Regulations (CFR)

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.

Colorado Floodplain and Stormwater Criteria Manual

The Manual prepared by the CWCB to, if needed, aid local officials and engineers in the proper regulation and design of Flood protected facilities. The Manual is advisory, rather than regulatory, in purpose.

Colorado Revised Statutes (CRS)

The codified general and permanent statutes of the Colorado General Assembly.

Colorado Water Conservation Board

As used in these Rules, "CWCB" refers to the agency and its staff, and "Board" refers to the Board of Directors of the Colorado Water Conservation Board.

Community

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, Native American tribes and drainage and Flood control districts.

Conditional Letter of Map Revision (CLOMR)

FEMA's comment on a proposed project, which evaluates potential project impacts on the hydrologic or hydraulic characteristics of a Flooding source. A CLOMR does not revise an effective Floodplain Map, but determines whether a proposed project, once constructed, would warrant revisions to the effective Flood Hazard Information.

Critical Facility or Critical Facilities

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.

Debris Flow

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.

Designation and Approval

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.

Detailed Floodplain Information

Floodplain information prepared utilizing topographic base mapping, supplemental survey data, Hydrologic Analysis, and hydraulic calculations (at the time of the study) to arrive at precise Flood Hazard Information suitable for making land use decisions under statutorily authorized zoning powers.

Development

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.

FEMA

Federal Emergency Management Agency.

FEMA Risk Mapping Assessment and Planning (Risk MAP) Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities

FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping, and associated resources, define the implementation details for statutory and regulatory requirements for NFIP mapping.

Flood or Flooding

A general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of water from Channels and reservoir spillways;
2. The unusual and rapid accumulation or runoff of surface waters from any source; or
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).

Flood Control Structure

A physical structure designed and built expressly or partially for the purpose of reducing, redirecting, or guiding Flood flows along a particular waterway.

Flood Hazard Information

Floodplain Maps, profiles, and other related information for Flood hazard areas that have been Designated and Approved by the Board. See Rule 5.

Flood Insurance Rate Map (FIRM)

A FIRM is the official FEMA Flood map for a Community for delineating both the 100-Year-Floodplain and 500-Year-Floodplain, the Floodway, and hazard zone designations applicable to the Community.

Flood Insurance Study (FIS)

A FEMA FIS is a compilation and presentation of Flood hazard data (information and maps) for watercourses, lakes, and other sources of Flood hazard within a Community for the NFIP. The FIS report contains detailed Flood elevation data in Flood profiles and data

tables.

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| Floodplain | 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. |
| Floodplain Management | The operation of an overall program of corrective, preventive, and maintenance measures for reducing potential Flood risk and associated damage, including, but not limited to, zoning or land-use regulations, Flood mitigation measures, and emergency preparedness plans. |
| Floodplain Management Regulations | 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 Floodplain preservation and potential Flood risk reduction to life, safety, health and property. |
| Floodplain Maps | 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), and Flood Insurance Rate Maps (FIRMs) 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 (USACE), Floodplain Information Reports published by the CWCB or others, Flood Hazard Area Delineation studies (FHADs) published by the Urban Drainage and Flood Control District (UDFCD) a/k/a the Mile High Flood District, and other locally adopted Floodplain Studies and master plans. |
| Floodplain Studies | A formal presentation of the study process, results, and technical support information developed for Floodplain Maps. |
| Floodway | 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. |
| Freeboard | 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 |

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| | watershed. |
| Geographic Information Systems (GIS) | 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, land use) for natural resource management and other uses. |
| Hydraulic analysis | The determination of Flood elevations, depths, and velocities for various storm frequencies/events based on a scientific analysis of the movement and behavior of floodwaters in Channels and overbank areas through a Basin or watershed. |
| Hydrologic Analysis | The computation of the hydrograph, peak rate of flow, or discharge in cubic feet per second, for various storm frequencies/events for streams, Channels, or watersheds based on a scientific analysis of the physical process resulting in precipitation runoff amounts at specific locations. |
| Letter of Map Revision (LOMR) | An official revision issued by FEMA to modify the currently effective FIRM and FIS. Based on supporting technical documentation, it is issued by FEMA for changes to Flood hazard potential, Flood zones, Flood hazard delineations, and corresponding Flood elevations. |
| Letter of Map Revision Based on Fill (LOMR-F) | FEMA's official determination document supporting a revision to the 100-Year-Floodplain, also known as the "Special Flood Hazard Area (SFHA)" or high risk Flood zone shown on the effective FIRM based on the placement of fill outside the effective regulatory Floodway. The determination is based on either the lowest adjacent grade or Lowest Floor relative to the effective BFE or 100-Year water surface elevation. This type of revision does not physically change the SFHA, but provides the property owner an official document verifying the property or building is above the regulatory Flood elevation at that location. |
| Levee or Levee System | A man-made structure or land feature (or series of structures or land features) designed and operated, wholly or in part, for the purpose of containing, controlling, or diverting the flow of water to reduce Flood risk potential for areas on the landward side of the Levee or Levee System. |
| Lowest Floor | The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, useable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor. Provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of 44 C.F.R. § 60.3. See Rule 17. |

**Low Impact
Development (LID)**

Development design/construction strategy that maintains the predevelopment hydrologic regime to the extent possible at the development site. 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.

**Material Safety Data
Sheet (MSDS)**

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.

Mitigation

The process of preventing disasters or reducing impacts of 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 or relocating structures, purchasing property for open space, and/or early Flood warning detection systems.

**Model-Backed
Approximate Flood
Elevation**

The 100-Year-Flood water surface elevation resulting from a hydraulic model used to determine an Approximate Floodplain.

**National Flood
Insurance Program
(NFIP)**

FEMA's program of Flood insurance coverage and national 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.

**Notice of Non-
Compliance (NONC)**

Written notification notifying a Community or person that the CWCB has discovered potential violations of these Rules.

**Post-Wildfire
Hydrology**

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.

**Provisionally
Accredited Levee
(PAL)**

A temporary FEMA Levee designation option for previously accredited Levees or Levee Systems recognized on a FIRM that allows mapping for an area while affording time for a Levee owner or Community to

provide data and documentation demonstrating the Levee still meets requirements set forth in 44 C.F.R § 65.10. A PAL notation on the FIRM indicates that the Levee owner has signed and submitted an agreement to FEMA to provide documentation of the structure's compliance under NFIP regulations within a specified period of time. As a result, FEMA has provisionally accredited the Levee (for a defined period of time), and that any designation of existing Zone X (shaded) areas due to Flood hazard reduction from a 1-percent-annual-chance-Flood on an effective FIRM (landward of the Levee) is also provisional.

Regulatory Floodplain

In Colorado the Regulatory Floodplain is the extents of the area subject to inundation by the 100-Year-Floodplain that have been Designated and Approved by the Board, unless a Community voluntarily elects to regulate to a 500-Year-Flood standard for certain circumstances.

Residual Risk

The Flood risk (probability of capacity exceedance or failure and the associated consequences) that remains after a Flood risk management or Mitigation measure has been implemented.

Special Flood Hazard Area (SFHA)

Special Flood Hazard Area means an area having special Flood, mudslide (i.e. mudflow), or Flood-related erosion hazards, and show on a Flood Hazard Boundary Map or FIRM as Zone A, AO, A1-30, AE, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, A99, AH.

Stream Alteration Activity

Any manmade activity within a stream or Floodplain that alters the natural Channel, geometry, or flow characteristics of the stream.

Substantial Damage / Substantially Damaged

Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial Improvement / Substantially Improved

Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures that have been Substantially Damaged, regardless of the actual repair work performed. The term does not, however, include either: 1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications, which have been identified by the Community and which are the minimum necessary to assure safe living conditions; or 2) Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure."

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| Threshold Planning Quantity (TPQ) | 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. |
| Topography | 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. |
| Use Change | Any change in the primary use of a facility or unimproved land. |
| Water Surface Profile | 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 alignment. |

Rule 5. Regulatory Floodplain:

The Regulatory Floodplain in Colorado is the 100-Year-Floodplain, unless a Community voluntarily elects to regulate to a 500-Year-Flood standard for certain circumstances. The Board will also Designate and Approve 500-Year-Floodplain information when available. 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 Communities 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 promote 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)(I), 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 facilities; (2) Hazardous materials facilities; (3) At risk populations facilities; and (4) Facilities 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.
- a. These facilities consist of:
- i. Public safety (police stations, fire and rescue stations, emergency vehicle and equipment storage, and emergency operation centers);
 - ii. Emergency medical (hospitals, ambulance service centers, urgent care centers having emergency treatment functions, and non-ambulatory surgical structures but excluding clinics, doctor offices, and non-urgent care medical structures that do not provide these functions);

- iii. Designated emergency shelters;
 - iv. 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);
 - v. 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
 - vi. 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).
- b. Specific exemptions to this category include wastewater treatment plants, non-potable water treatment and distribution systems, and hydroelectric power generating plants and related appurtenances.
- i. 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.
 - ii. Public utility plant facilities may be exempted if it is demonstrated to the satisfaction of the Community 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 Regulatory 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 Community on an as-needed basis upon request by that Community.
- (2) *Hazardous materials facilities* include facilities that produce or store highly volatile, flammable, explosive, toxic, and/or water reactive materials.
- a. These facilities consist of:
 - i. Chemical and pharmaceutical plants (chemical plant, pharmaceutical manufacturing);

- ii. Laboratories containing highly volatile, flammable, explosive, toxic and/or water reactive materials;
 - iii. Refineries;
 - iv. Hazardous waste storage and disposal sites; and
 - v. Above ground gasoline or propane storage or sales centers.
- b. 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 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 TPQ for that chemical, then that facility shall be considered to be a Critical Facility. OSHA requirements for MSDS can be found in 29 C.F.R. § 1910. See Rule 17.
- i. 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, also known as Extremely Hazardous Substances; or 10,000 pounds for any other chemical. This threshold is consistent with the requirements for reportable chemicals established by the Colorado Department of Public Health and Environment (CDPHE). The Environmental Protection Agency (EPA) regulation "Designation, Reportable Quantities, and Notification," can be found at 40 C.F.R. § 302. See Rule 17.
- c. Specific exemptions to this category include: Finished consumer products within retail centers and households containing hazardous materials intended for household use, and agricultural products intended for agricultural use; Buildings and other structures containing hazardous materials for which it can be demonstrated to the satisfaction of the Community and certification by a qualified professional (as determined by the Community) that a release of the subject hazardous material does not pose a major threat to the public; and Pharmaceutical sales, use, storage, and distribution centers that do not manufacture pharmaceutical products.
- d. 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.
- a. These facilities consist of:
 - i. Elder care (nursing homes);
 - ii. Congregate care serving 12 or more individuals (day care and assisted living); and

- iii. 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.
 - a. These facilities consist of:
 - i. Essential government operations (public records, courts, jails, building permitting and inspection services, community administration and management, maintenance and equipment centers);and
 - ii. Essential structures for public colleges and universities (dormitories, offices, and classrooms only);
 - b. These facilities may be exempted if it is demonstrated to the satisfaction of the Community 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 Regulatory 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 Community on an as-needed basis upon request by that Community.

B. Identification of Critical Facilities.

- (1) It is the responsibility of the Community 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 Community. For those structures for which it is unclear or otherwise ambiguous if the criteria are met, the Community shall have the sole discretion to determine if the structure is a Critical Facility. Communities 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., 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. These activities may still require coordination with the Community and be subject to other local, state, and federal requirements or permits.
- (2) Required identification of Critical Facilities shall be limited to owner-occupied structures. Communities 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 and has occurred above and beyond 100-Year-Flood events. Communities are encouraged to regulate Development of Critical Facilities within the 500-Year-Floodplain, when available.

D. **Protection of Critical Facilities.**

- (1) All new, Substantially Damaged, and Substantially Improved Critical Facilities, and new Additions to Critical Facilities, shall be regulated to a higher standard than those structures not determined to be Critical Facilities. Communities are encouraged to consult with the owner of the Critical Facility in determining the value of the Critical Facility when a Substantial Damage and/or Substantial Improvement is being considered.
- (2) 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.
- (3) The higher standard for Critical Facilities shall be as follows: For Critical Facilities located within the Regulatory Floodplain, the structure shall be protected according to Rule 11.B. herein, with the exception of a two-foot Freeboard requirement substituted for the standard one-foot Freeboard. The International Building Code and Flood Resistant Design and Construction (ASCE 24) can be used as reference tools for this standard, but are not incorporated by reference herein.
- (4) 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.
- (5) 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.
- (6) All other rules and regulations governing structures not deemed Critical Facilities remain in effect and unchanged.

E. **Ingress and Egress for New Critical Facilities.** New Critical Facilities shall, when practicable as determined by the Community, have continuous non-inundated access (ingress and egress for evacuation and emergency services) during a Regulatory Flood event. This criterion is also recommended, but not required, for changes to existing Critical Facilities and use changes involving existing structures or unimproved lands whose classification changes to Critical Facilities.

- F. **Variations.** 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 Community 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 Communities for the purpose of 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 by the Board in order to enable Communities to regulate floodplains appropriately. The standards in this rule reference, and incorporate herein, the FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities, and associated resource documents.
- 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 Board shall Designate and Approve 100-Year-Floodplain information, and 500-Year-Floodplain information when available.
- C. **Base Mapping.** Base mapping for Floodplain Studies shall meet the minimum standards as set forth in FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities.
- D. **Topography and Surveys.** Topographic and field survey information for Floodplain Studies shall meet the minimum standards as set forth in FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities.
- E. **Geographic Information Systems (GIS).** GIS information for Floodplain Studies in Colorado shall meet the minimum standards as set forth in FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities.
- F. **Hydrology.** Hydrologic Analyses for Floodplain Studies in Colorado shall be completed using the information set forth in FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities. The Colorado Floodplain and Criteria Stormwater 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.

- (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 Board that clearly demonstrates that the information in question is inaccurate pursuant to Rule 12. The Board 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 FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities.
- H. **Floodplain Delineations.** Floodplain delineations shall be completed using protocols set forth in FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities , 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 meet or exceed FEMA NFIP standards for tolerance and technical accuracy for correlation to the best available topographic information for the stream and adjacent corridor.
 - (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 geospatial data 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 Regulatory Flood involving special conditions shall be completed using protocols set forth in FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities. 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 may 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, may be produced at the request of the Community or by Board initiative. The interim Floodplain Maps should show increased runoff from hydrophobic soils and lack of vegetation. The post-wildfire maps may 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 outlined in the FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities, *Guidance for Flood Risk Analysis and Mapping: Ice Jam Analyses and Mapping*.

J. **Written reports and maps.** The results of the Hydrologic Analyses, Hydraulic Analyses, and Flood hazard area delineations shall be summarized in a written report and submitted to the CWCB. All Approximate and Detailed Floodplain Information that is presented to the Board for Designation and Approval shall be properly titled, dated, organized, and compiled as a stand-alone digital document (in MS Word and PDF formats). All pertinent technical backup data to support the flood hazard study, regardless of data format be provided to the CWCB in acceptable digital formats. The CWCB shall make pertinent supporting documentation for flood hazard studies available for access to interested parties, to the extent possible, through a secure data sharing platform. In one-dimensional riverine situations, 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 Flood hazard 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 Development 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 based on revised Flood hazard studies or 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 Model-Backed Approximate Flood Elevations or BFEs 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), for the FEMA minimum requirement of a 1-foot floodway. See Rule 17.
- C. **Incorporation of FEMA's Floodway Regulations.** All Communities participating in the NFIP that have BFEs or Model-Backed Approximate Flood Elevation defined for one or more of the waterways within their jurisdictions shall adopt and enforce the "Criteria for Land Management and Use" Floodway regulations at 44 C.F.R. § 60.3(c)(10), (d). Failure to enforce Floodway regulations may impact the Community's standing in the NFIP and may eliminate or reduce eligibility for federal or state financial assistance for Flood Mitigation and disaster relief purposes.
- D. **Communities in Which This Rule Applies.** Communities with Regulatory Floodplains that have been Designated and Approved by the Board with BFEs or Model-Backed Approximate 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 to approximate stream reaches for which BFEs or Model-Backed Approximate Flood Elevation have not been defined (i.e. non-model-backed Flood hazard areas).

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.**
 - (1) If a publicly operated and maintained structure, as further defined in subparagraph B.(3), 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 attenuation of peak Flood discharges, which would result from normal Flood Control Structure operating procedures.
 - (2) 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/or infiltration and are publicly operated and maintained in accordance with subparagraph B.(3).
 - (3) For the purposes of this Rule, public operation and maintenance is required for credit of the flood control structure, which may include direct responsibility, ultimate Community responsibility, or Community enforcement. See 44 C.F.R. § 65.6 (a)(12). This does not

apply to state or federally operated and/or maintained facilities. 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 impacts downstream, shall not be taken into account, and the delineation of the Flood hazard areas 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 Flood hazard areas 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-Flood 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 either a signed adequate assurance agreement, or the Community's adopted master plan of:
- (1) The Flood routing capability of the reservoir, as shown by comparison of the 100-Year-Flood hazard area in plan and profile (where applicable) 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 Community 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 Communities, 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 Community maintenance access to the irrigation facility 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 Board will Designate and Approve 100-Year-Flood Flood Hazard 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:

- A. **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 and annotated on the FIRM in accordance with FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities. 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.
- (1) 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.
 - (2) 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. Artificial embankments that either function as a Levee or a Flood Control Structure must meet the provisions of this Rule or the “Office of the State Engineer Rules and Regulations for Dam Safety and Dam Construction,” 2 C.C.R. 402-1, respectively, in order to be considered as providing protection. See Rule 17.
- B. **Maintenance.** An operating and maintenance manual that ensures continuous 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 in Rule 10.A.(2), shall be provided to CWCB. A visual inspection shall be required on a three-year basis to demonstrate that the Levee continues to be structurally sound and adequately maintained and results of the inspection shall be 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 without a funded project plan to bring the Levee deficiencies into compliance (to be considered on a case-by-case basis).
- C. **Ownership.** Privately-owned or non-Community-owned Levee systems shall only be considered in the Hydraulic Analysis if they are publicly operated and maintained. For the purposes of this Rule, public operation and maintenance is required for credit of the Levee system, which may include direct responsibility, ultimate Community responsibility, or Community enforcement. See 44 C.F.R. § 65.6 (a)(12). Levees for which the Community, state, or federal government has responsibility for operations and maintenance will be considered, provided that the criteria set forth in this Rule are met.

- D. **Levee Analysis and Standards Consistent with Federal Regulation.** To comply with these Rules, analysis of Levees and Levee standards for Freeboard, interior drainage, and human intervention and operation must comply with the standards in 44 CFR § 65.10 and the FEMA Risk MAP Technical References, Guidelines and Standards for Flood Risk Analysis & Mapping Activities, *Guidance for Flood Risk Analysis and Mapping: Levees*, Guidance Document 95.

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, see Rule 17, unless more restrictive standards have been adopted as set forth in these Rules or pursuant to regulations adopted by the Community. These Rules do not apply to local stormwater or local storm drainage studies where riverine Flooding sources are not considered.
- B. **Minimum Freeboard.** A minimum Freeboard of one foot above the 100-Year-Flood elevation (BFE or Model-Backed Approximate Flood Elevation) shall apply to structures in the Floodplain as follows:
- (1) **Residential Structures.** New, Substantially Damaged, and/or Substantially Improved 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 BFE or Model-Backed Approximate Flood Elevation. In AO Zones, new, Substantially Damaged, and/or Substantially Improved residential structures, and Additions to existing residential structures shall be constructed with the Lowest Floor, including basements, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the Community’s FIRM (at least two feet if no depth number is specified) plus one foot of Freeboard.
 - (2) **Non-residential Structures.**
 - a. New, Substantially Damaged, and/or Substantially Improved 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 BFE or Model-Backed Approximate Flood Elevation, or together with attendant utility and sanitary facilities, be designed so that the structure is watertight to an elevation at least one foot above the BFE or Model-Backed Approximate Flood Elevation with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. In AO Zones, new, Substantially Damaged, and/or Substantially Improved non-residential structures and Additions to existing non-residential structures shall be constructed with the Lowest Floor, including basements, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the Community’s FIRM (at least two feet if no depth number is specified) plus one foot of Freeboard, or together with attendant utility and sanitary facilities be completely floodproofed to that level with walls substantially impermeable to the past of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. Agricultural

Structures and Accessory Structures shall be exempt from the Freeboard requirement but shall meet all other requirements set forth in FEMA Policy No. 104-008-03: Floodplain Management Requirements for Agricultural Structures and Accessory Structures.

- b. Critical Facilities shall be regulated according to Rule 6.D. This Rule does not affect the Freeboard requirement for Levees described in Rule 10.D.
- 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 LOMR-F unless the Lowest Floor elevation placed below the BFE or Model-Backed Approximate Flood Elevation with one foot of Freeboard that existed prior to the placement of fill. In AO Zones, new structures shall be constructed with the Lowest Floor, including basements, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the Community's FIRM (at least two feet if no depth is specified) that existed prior to the placement of fill plus one-foot of Freeboard. 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.
- D. **Highest Adjacent Grade.** For the purposes of this Rule 11, highest adjacent grade means the highest natural elevation of the ground surface, prior to the start of construction, next to the proposed walls of a structure.

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. 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-Flood flow. The Channel improvement shall not cause increased velocities or erosive forces upstream or downstream of the improvement.
- B. 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 residual 500-Year-Floodplain.

- C. All dams must be maintained to ensure that they retain their structural and hydraulic integrity pursuant to FEMA Risk MAP Technical References, Guidelines, and Standards for Flood Risk Analysis and Mapping Activities, *Dams/Reservoirs and Non-Dam Features*. See Rule 17. All Levees must be maintained to ensure that they retain their structural and hydraulic integrity

pursuant to FEMA Risk MAP Technical References, Guidelines, and Standards for Flood Risk Analysis and Mapping Activities, *Levees*. See Rule 17.

- D. Any Stream Alteration Activity proposed by a project proponent in either i) a Floodway or ii) a Regulatory Floodplain with no established Floodway (except in shallow Flooding areas, defined as Flooding with an average depth limited to 3.0 feet or less where no defined Channel exists) must be evaluated for its impact on the Regulatory Floodplain. All Stream Alteration Activity shall be in compliance with all applicable federal, state and local Floodplain rules, regulations and ordinances.
- E. Any Stream Alteration Activity shall be designed and sealed by a Colorado Registered Professional Engineer.
- F. 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.
- G. For compliance purposes, Stream Alteration Activities shall not be constructed in a Floodway unless the project proponent demonstrates through a Floodway analysis and report, sealed by a Colorado Registered Professional Engineer, that there is no rise resulting from the project unless a CLOMR has been obtained. No rise means a 0.00-foot rise or a decrease in the Flood elevation between the existing and proposed conditions. Stream Alteration Activities proposed in a Regulatory Floodplain with no established Floodway (except in shallow Flooding areas, defined as Flooding with an average depth limited to 3.0 feet or less where no defined Channel exists), shall demonstrate no more than 1/2-foot rise in Flood elevations (or a more stringent standard adopted by the Community) between the existing and proposed conditions unless a CLOMR is obtained. This requirement only applies on stream reaches with BFEs or Model-Backed Approximate Flood Elevations established.
- H. Rule 12.D. addresses when hydraulic modeling is required for Stream Alteration Activities. For map update purposes, regardless of whether modeling is required or not, whenever a Stream Alteration Activity is shown by hydraulic modeling to increase or decrease the established BFE in excess of 0.30 vertical feet between the pre-project and post-project conditions (or a more stringent standard adopted by the Community), a LOMR (or comparable revision process) showing such changes shall be obtained in order to accurately reflect the proposed changes on the Regulatory Floodplain map for the stream reach. This is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk assessment and Floodplain management requirements will be based upon current data, 44 CFR § 65.3. The Community is responsible for ensuring that this process is pursued. This section herein does not require a CLOMR to be applied for, unless mandated by the Community. This section reflects state policy and may not fully reflect federal and other requirements for map maintenance. This section is not intended to undermine or replace federal requirements, and Communities and project proponents are responsible for satisfying any other map maintenance requirements as a result of Stream Alteration Activities.

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 CWCB 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 Board will Designate and Approve 500-Year-Floodplain information when available.
- C. **Provisional Designation.** The Board 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 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 CWCB 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 CWCB'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 CWCB may take action at its own initiative to consider the Designation and Approval of Floodplain information. In such cases, the CWCB shall notify the affected Communities in writing at the time of study initiation or, in the case of a previously completed study, the CWCB will endeavor to 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. Regardless of Community concurrence, CWCB may pursue Designation and Approval.
- (3) **Notification of Adopted Resolutions.** The CWCB shall send signed copies of each adopted resolution of Designation and Approval to each Community 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 FIRMs 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 Board will designate the revised Floodplains by adopting

written resolutions based upon such Floodplain information as the Board determines meets the standards set forth in Rules 6-12.

- A. 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 if it is to the same or greater level of detail as the previously designated Regulatory Floodplain information, has been approved through a detailed technical review by a qualified Colorado Professional Engineer, and meets one of the following conditions in (1) – (3). Communities may need to formally adopt this information through its local adoption process.
- (1) Regulatory Floodplain included on a FEMA FIRM – the revised Floodplain mapping is more restrictive, the Community has informed all impacted property owners of the change and provided due process as established in Community guidelines, and the revised Floodplain mapping is ultimately Designated and Approved by the Board; or
 - (2) Regulatory Floodplain not included on a FEMA FIRM – the Community has informed all impacted property owners of the change, and provided due process as established in Community guidelines. The Community must submit Floodplain mapping revisions for Designation and Approval by the Board in a timely manner (not to exceed two years from the date of completion); or
 - (3) Regulatory Floodplain – the revised Floodplain mapping has been approved by FEMA through a LOMR or Physical Map Revision process, and ultimately Designated and Approved by the Board.
- B. **Conditions.** All changes to Regulatory Floodplains shall meet or exceed the same conditions as those required for original Designation and Approval.
- C. **Process for Designation and Approval of Changes to a Regulatory Floodplain.** The Board may consider the Designation and Approval of changes to Regulatory 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 CWCB 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 CWCB’s Initiative.** If Designation and Approval of changes to a Regulatory Floodplain would be in the best interest of the health, safety, welfare and property of the citizens of the State of Colorado, then the CWCB may take action at its own initiative to consider the Designation and Approval of Floodplain information. In such cases, the CWCB shall notify the affected Communities in writing at the time of the study initiation or, in the case of a previously completed study, the CWCB will endeavor to 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. Regardless of Community concurrence, CWCB may pursue Designation and Approval.

- (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 each Community within the limits of the changed Floodplain within 30 calendar days of Designation and Approval.
- D. **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.
- E. **Map Revisions to Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps.** Floodplain Map revisions (e.g., FEMA LOMRs) may be designated twice annually by the Board 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 Community.** Request for a variance to any of these Rules may be considered by the Community, 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 Community may, at its sole discretion, use an established variance procedure.

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

- (1) Communities 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 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 FEMA, other state agencies, the Community 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 Community.
 - 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 recommends.
- (2) FEMA Region VIII shall support, through its NFIP activities, these Rules. This support will include the existing ability for FEMA to place sanctions upon a Community for non-compliance.
- (3) Certain Board 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:

- A. The following rules, regulations, standards, and guidelines are hereby incorporated by reference:
 - (1) FEMA Risk Mapping, Assessment and Planning (Risk MAP) Technical References, Guidelines and Standards for Flood Risk Analysis and Mapping Activities, December 1, 2020, available at <https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards>, including but not limited to the following specific guidance documents:
 - a. *Guidance for Flood Risk Analysis and Mapping: Ice Jam Analyses and Mapping;*
 - b. *Guidance for Flood Risk Analysis and Mapping: Levees;* and
 - c. *Guidance for Flood Risk Analysis and Mapping: Dams/Reservoirs and Non-Dam Features.*
 - (2) FEMA National Flood Insurance Program, 44 C.F.R. §§ 59, 60, 65, 70, and 72, May 13, 2021, available at <https://www.ecfr.gov/cgi-bin/text-idx?SID=504ee2bfc731d90f6be69c8f09fd0b3c&mc=true&tpl=/ecfrbrowse/Title44/44CIsu bchapB.tpl>.
 - (3) The United States Environmental Protection Agency Superfund, Emergency Planning, and Community Right-to-Know Programs, Designation, Reportable Quantities, and Notification Regulations, 40 C.F.R. § 302, May 13, 2021, available at <https://www.ecfr.gov/cgi-bin/text-idx?node=pt40.30.302&rgn=div5>.
 - (4) The Occupational Safety and Health Administration Occupational Safety and Health Standards Regulations, 29 C.F.R. § 1910, May 13, 2021, available at <https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=13981877314c1c75ef4ee8c5652c8449&ty=HTML&h=L&mc=true&n=pt29.5.1910&r=PART>.
 - (5) The Colorado Office of the State Engineer Rules and Regulations for Dam Safety and Dam Construction Materials, 2 CCR 402-1, January 1, 2020, available at <https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=8426&fileName=%20CCR%20402-1>.

- (6) FEMA Policy No. 104-008-03: Floodplain Management Requirements for Agricultural Structures and Accessory Structures, February 2020, available at https://www.fema.gov/sites/default/files/2020-08/fema_floodplain-management_agriculture-accessory-structures_2020.pdf.
- B. These rules, regulations, standards, and guidelines in subparagraphs (1)-(6) of Rule 17.A. are hereby incorporated by reference by the Board and made a part of these Rules. Materials in these Rules, which are incorporated by reference are limited to those materials in existence as of the effective date of these revised Rules and do not include later amendments to or editions of such rules, regulations, standards, and guidelines. The material incorporated by reference is available for public inspection during regular business hours at the office of the Colorado Water Conservation Board, 1313 Sherman Street, Room 718, 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 NFIP and possibly FEMA's Community Rating System 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-Flood and 500-Year-Floods. Floods greater than 500-Year-Floods (0.2-percent-annual-chance Floods) do occur, and loss of life and property is possible in areas mapped outside of both the 100-Year-Floodplain and 500-Year-Floodplain.
- 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-Flood 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 Damage may occur. Flooding greater than 500-Year-Flood events can and do occur as well, and loss of life and property is possible in areas mapped outside of both the 100-Year-Floodplain and 500-Year-Floodplain. 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 Service Center, NFIP, 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.
- W. A Community may regulate any Designated and Approved 100-Year shallow Flooding areas, defined as Flooding with an average depth limited to 3.0 feet or less where no defined Channel exists.
- X. Detention/Flood control storage and LID should be considered, when practicable, as part of a basinwide program for the watershed.

Rule 20. Effective Date:

These revised Rules shall apply to the Designation and Approval of all Flood Hazard Information made by the CWCB and all other Floodplain activities on or after January 14, 2022 and are, therefore, not retroactive to any Floodplain information Designated and Approved by the Board or other Floodplain activities prior to the effective date.