Boulder County

Transportation Department

2525 13th Street, Suite 203 • Boulder, Colorado 80304 • Tel: 303.441.3900 • Fax: 303.441.4594
Mailing Address: P.O. Box 471 • Boulder, Colorado 80306 • **www.bouldercounty.org**

BOULDER COUNTY
BOARD OF COUNTY COMMISSIONERS

May 16, 2017 – 2:00 P.M.

Hearing Room, Third Floor
Boulder County Courthouse

PUBLIC HEARING

Docket Z-17-0001: Zoning Map Amendments to the Floodplain Overlay District

Request: Zoning map amendments for the Floodplain Overlay District ("FO District"), specifically the Boulder County Floodplain and Floodway, based upon the floodplain remapping of the Colorado Hazard Mapping Program ("CHAMP"), Federal Emergency Management Agency ("FEMA") Risk MAP and other best available data.
Location: Waterways throughout unincorporated Boulder County
Applicant: Boulder County

Docket DC-17-0001: Land Use Code text amendments to the floodplain regulations and related Provisions

Request: Land Use Code ("Code") text amendments to amend Boulder County's floodplain regulations, codified in Articles 4-400 et seq.

REQUEST FOR DOCKET AUTHORIZATION

Docket Z-17-0002: Zoning Map Amendments for CHAMP Phase II Mapping

Request: Authorization to proceed with this Land Use docket for analysis of proposed Boulder County Zoning Map Amendments to the FO District based upon the second phase of floodplain remapping from various flood studies including Phase II of the CHAMP, FEMA studies, and other best available data, anticipated to be available January 2018.

PACKET CONTENTS

Risk (FEMA and the State of Colorado, 2017) (Exhibit A)	
o Listing of public notice and involvement (Exhibit B)	B1 – B2
o Description of interactive floodplain web map (Exhibit C)	C1
o Redlined amendments to Land Use Code Article 4-400 (Exhibit D)	D1 – D48
o Summary table of proposed changes (Exhibit E1)	E1
o Description of Select Substantive Proposed Code Changes (Exhibit E2)	E2 – E4
o List of public comments received on draft floodplain mapping (Exhibit F)	F1– F12

STAFF PLANNERS: Varda Blum, Floodplain Program Manager, and Erin Cooper, Floodplain Specialist

BACKGROUND

Since 1979, Boulder County ("County") has belonged to the National Flood Insurance Program ("NFIP"), administered by the Federal Emergency Management Agency ("FEMA"). The program provides a means for the residents of Boulder County to purchase flood insurance and receive assistance from the federal government after flooding. As part of receiving that benefit, the County is required to adopt floodplain regulations that reflect FEMA and the Colorado Water Conservation Board's ("CWCB") requirements for development in the floodplain. These floodplain regulations include the requirement for floodplain development permits for all human disturbances in the floodplain and apply throughout the Floodplain Overlay District- a zoning area that is defined by floodplain maps which depict the extent of the predicted 1% annual-chance (100-year) floodplain.

September 2013 Flood Altered Floodplains

The September 2013 Flood significantly changed creek size, shape, and location and altered floodplains in areas throughout Boulder County and other areas of the state. In response, the State of Colorado ("State") is taking steps towards bolstering long-term planning and resiliency efforts by funding the Colorado Hazard Mapping Program ("CHAMP"), managed by the CWCB. CHAMP will update local hazard information, including producing new regulatory floodplain maps for the most affected waterways.

The updated analysis and remapping is actually part of two concurrent efforts: 1) CHAMP, funded through Senate Bill 15-245; and 2) St. Vrain Watershed Risk MAP study, funded jointly by FEMA and CWCB. For simplicity, and because the two remapping programs are being run concurrently, the two efforts are referred to together throughout this memo as "CHAMP". Ultimately, the new floodplain maps produced by the CWCB through CHAMP will be adopted by FEMA as Flood Insurance Rate Maps ("FIRMs").

Creating final FIRMS is a multi-year, iterative process that involves several cycles of technical data analysis, map production, and map revision, including production of draft mapping, preliminary FIRMs, a formal FEMA appeal period, and final regulatory FIRMs. It can take three to five, or even eight to ten, years to go from the creation of 'draft' mapping to the final step of the FIRM becoming effective. FEMA flood insurance requirements and rate

calculations change only when FEMA adopts the new floodplain maps as FIRMs, as this is when the new floodplain maps officially become "FEMA effective" maps.

Boulder County Supports State Remapping Initiative
The County is supporting the State and FEMA remapping initiative by sponsoring a significant public education and outreach program and providing local technical review of proposed maps. Most of the current effective regulatory floodplain maps for Boulder County were produced in the 1980s. In addition to the changes to waterways caused by the September 2013 Flood, many land use changes have occurred since the 1980s, and the available information and technology to forecast flood risk have increased in accuracy. All of these changes reduce the accuracy of the County's current regulatory floodplain maps, which in turn reduces the effectiveness of flood risk management. New floodplain maps will more accurately represent where flooding will likely occur, providing detailed information for property owners regarding flood risks and enabling more effective floodplain management that will better protect the health, safety, and welfare of Boulder County residents.

Land Use Docket DC-15-0004
In September 2016, Land Use Docket DC-15-0004 amended the *Boulder County Land Use Code* to create the local Boulder County Floodplain and Floodway as part of the Floodplain Overlay District. As a result, the County's Floodplain Overlay District zoning map now includes both the FEMA effective 100-year floodplain and floodway and the local Boulder County Floodplain and Floodway.

The Boulder County Floodplain and Floodway are derived from local studies, such as CHAMP, that have yet to be formally adopted by FEMA. Because local studies reflect the best available data on flood hazard risk for a specific area, when new local flood risk studies such as CHAMP are completed, the County may adopt them through a comprehensive zoning map amendment of the Floodplain Overlay District that includes technical review, public notification, and hearings before the Planning Commission and the Board of Commissioners.

Further, FEMA requires the extents of the FEMA effective 100-year floodplain to remain a part of the Floodplain Overlay District until it adopts the local studies as new FIRMs. Per guidance from FEMA and CWCB (Exhibit A), in locations within the Floodplain Overlay District where there is overlapping FEMA and Boulder County Floodplain and Floodway, the most conservative study is considered controlling. When the local study is eventually adopted by FEMA into the FIRM, the Boulder County Floodplain and Floodway generally becomes one and the same as the FEMA effective map in that area.

CHAMP Floodplain Mapping
Floodplain mapping is based on hydraulic studies involving data collection, analysis, and numerical modeling of the interaction between the existing topography and the predicted flow in creeks during the 1% chance flood. The CHAMP mapping incorporates post-flood topographic survey and analysis of flow that included rainfall and stream data collected during the September 2013 Flood.

Traditionally, information about revised flood hazards is not received by communities until after FEMA has already created a preliminary FIRM and releases that preliminary FIRM at the beginning of a formal appeal period. However, at the request of County staff, CWCB

committed to delivering 'draft' mapping associated with the CHAMP project to the County much earlier than is the norm so that County staff would be able to:

- Engage in technical review and provide feedback to CWCB/FEMA early in the process when change is easier to make; and
- Engage community members that have site specific on-the-ground knowledge to also provide timely feedback to the remapping process.

This process also allows the County, after a period of technical review and community outreach, to adopt the draft floodplain mapping as Best Available Data contained within the Boulder County Floodplain and Floodway within the Floodplain Overlay District. Additional details of the public outreach and involvement process for draft map review are provided in Exhibit B.

CHAMP has divided the stream reaches being studied in Boulder County into Phase 1 and Phase 2. The reaches contained within CHAMP Phase 1 are the subject of this hearing. CHAMP Phase 2 includes approximately 120 miles of streams that generally have a reach that is adjacent to roadwork areas in which a construction project has been recently completed or is still ongoing. CHAMP draft mapping of the Phase 2 areas will be delivered in Fall 2017.

On October 30, 2016, the County received Phase 1 draft updated floodplain analysis and remapping for approximately 160 miles of streams in Boulder County. Between the delivery of the initial Phase 1 mapping and the date of this hearing, County staff has engaged in technical review, requested revisions to the first draft, and conducted extensive outreach to residents that is described further below.

In March 2017, the County received *revised* Phase 1 draft mapping from the CWCB. The updated draft incorporated some revisions to the original October 2016 draft that were suggested by residents and by County staff as part of their technical review. The March 2017 CHAMP draft has been submitted by CWCB to FEMA for review. Staff anticipates that it will be approximately one year until the next revision of the Phase 1 mapping, when 'preliminary FIRMs' are available for review.

AUTHORIZATION OF Z-17-0001 and DC-17-0001

On January 10, 2017, in light of receipt of the draft CHAMP Phase 1 mapping, the Board of County Commissioners authorized staff to proceed with analysis of:

- Possible comprehensive zoning map amendments for the Floodplain Overlay District, specifically the Boulder County Floodplain and Floodway, based upon the floodplain remapping of CHAMP, FEMA Risk MAP, and other best available data (Docket Z-17-0001).
- Possible text changes needed to the Land Use Code (Docket DC-17-0001) floodplain regulations to allow for the incorporation of the mapping data addressed in Z-17-0001 into the Boulder County Floodplain and Floodway as well as to make any needed additional changes to provisions of the floodplain regulations needed to protect the health, safety and welfare of the residents of Boulder County.

SUMMARY OF PROPOSED FLOODPLAIN OVERLAY DISTRICT ZONING MAP AMENDMENTS (Docket Z-17-0001)

The proposed zoning map amendments include updates to the Boulder County Floodplain and Floodway within the Floodplain Overlay District, along stream reaches within unincorporated Boulder County shown below (Figure 1):

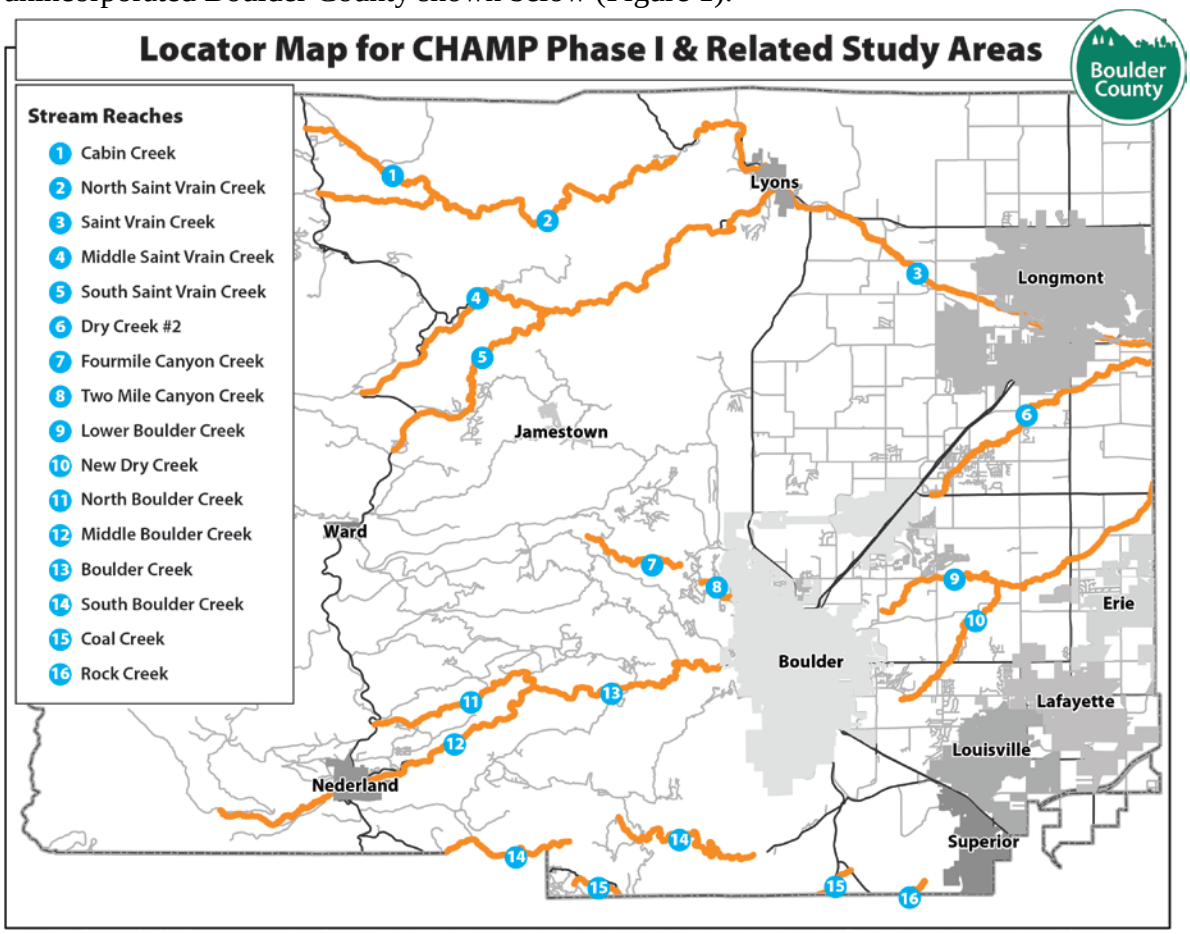


Figure 1: Z-17-0001 Proposed Amendment Areas to Boulder County Floodplain in Floodplain Overlay District

The full extent, as well as a detailed breakdown, of the proposed zoning map amendments is shown on an interactive web map at **http://arcg.is/2fF4CZY.** The web map can also be accessed from the bouldercounty.org homepage, by going under 'Property & Land' in the main heading, then going to 'Floodplain Management' in the drop-down window that appears, then choosing the link for 'Floodplain Remapping in Boulder County' to get to the Floodplain Remapping Project homepage at:
http://www.bouldercounty.org/roads/plans/pages/floodplainremappingproject.aspx
On that page choose 'View the Draft Maps' to get to the web map.

On the web map, the proposed amendments to the Floodplain Overlay District are on the layer labeled 'Proposed Regulatory Flood Risk Zones.' In order to see which areas of the Floodplain Overlay District are current effective FEMA Floodplain and Floodway or proposed Boulder County Floodplain and Floodway, toggle on and off the 'Regulatory Flood Risk Zones' layer. Additional explanation of the layers of the web map is provided in Exhibit C.

ARTICLE 4-1102 ZONING MAP AMENDMENT CRITERIA

Staff has reviewed the conditions and standards for approval for zoning map amendments

under Article 4-1102 of the *Boulder County Land Use Code*, and finds the following:

1) **A public need exists for the map amendment;**

   Staff finds, as described in the Background section above, that the current Floodplain Overlay District floodplain mapping is largely out of date. The proposed map amendment will more accurately represent where flooding will likely occur, providing detailed information for property owners regarding flood risks and enabling more effective floodplain management that will better protect the health, safety, and welfare of Boulder County residents.

   Therefore staff determines that this criteria is met.

2) **The amendment is consistent with and in furtherance of the stated intent and purposes of this Code;**

   Staff finds that the proposed Floodplain Overlay District map amendments reflect the best available flood risk data consistent with and in furtherance of the stated intent and purpose of Article 4-400 of the Land Use Code, Floodplain Overlay District:

   Section 4-401, Purpose, *' …. to protect life, property, and health; to ensure the best available data is used in making development decisions; …'.*

   Therefore staff determines that this criteria is met.

3) **The amendment is in accordance with the *Boulder County Comprehensive Plan*;**

   Staff finds the proposed map amendment is in accordance with the Boulder County Comprehensive Plan, Natural Hazards Element, Goals, Policies, & Maps including:

   - Natural Hazard Goal L.1: *'Inappropriate development in natural hazard areas should be reduced as much as possible or eliminated in order to minimize potential harm to life, health, and property'*
   - Natural Hazards Policy NH1.02: *'Natural hazards potentially affecting the county should continue to be identified and made known to the public and public officials. The county should promote a high level of public awareness about the risks of these identified hazards which may impact people, property, and their environment.…'*
   - Natural Hazards Policy NH4.01: *'The county should strongly discourage and strictly control land use development from locating in designated floodplains, as identified in the Boulder County Zoning Maps'*

   Adopting the best available floodplain data in to the Floodplain Overlay District will reduce, as much as possible, inappropriate development in known flood risk areas. The proposed amendments will also make the best available flood risk data known to the public and public officials and result in the desired high level of public awareness of the risks of the identified flood hazards.

   Therefore staff determines that this criteria is met.

4) **The subject property is an appropriate site for the map amendment, and is a reasonable unit of land for such reclassification;**

Staff finds that their technical review of the hydrologic data, modeling procedures, and floodplain mapping supporting the proposed amendments, and CHAMP having also engaged in extensive quality assurance and determined that the draft mapping is suitable for submittal to FEMA for their review, indicates that the proposed amendments represent the best available flood hazard information and that the subject properties are appropriate sites for the map amendment and should be reclassified as proposed.

Therefore staff determines that this criteria is met.

5) **The map amendment would not have a material adverse effect on the surrounding area;**

Staff finds that the map amendments will benefit the welfare, health, and safety of surrounding areas by supporting appropriate regulation of development within identified flood hazard areas, minimizing development that might increase flood hazard risks for those surrounding areas.

Therefore staff determines that this criteria is met.

6) **The map amendment will not result in an over-intensive use of land;**

Staff finds that this criteria is not applicable.

7) **The map amendment will not have a material adverse effect on community capital improvement programs;**

Staff finds that the map amendments will benefit community capital improvement programs by supporting appropriate regulation of development within identified flood hazard areas, minimizing development that might increase flood hazard risks for those programs.

Therefore staff determines that this criteria is met.

8) **The map amendment will not require a level of community facilities and services greater than that which is available;**

Staff finds that local adoption of the best available flood hazard risk information serves to inform residents and visitors to Boulder County of known flood hazards. Knowing the risk encourages preparation for that risk and ultimately results in a more resilient community and also better use of community resources during flooding events.

Therefore staff determines that this criteria is met.

9) **The map amendment will not result in undue traffic congestion or traffic hazards;**

Staff finds that this criteria is not applicable.

10) The map amendment will not cause significant air, odor, water, or noise pollution;

Staff finds that this criteria is not applicable.

11) The map amendment will not permit the use of any area designated within the *Boulder County Comprehensive Plan* for the extraction of commercial mineral deposits in a manner which would interfere with the present or future extraction of such deposit by an extractor to any greater extent than under the present zoning of the property;

Staff finds that this criteria is not applicable.

12) It must be demonstrated that any structures to be built on the property will not be affected by geologic hazards if they exist;

Staff finds that this criteria is not applicable.

13) The map amendment will not otherwise be detrimental to the health, safety, or welfare of the present or future inhabitants of Boulder County;

Staff finds that the proposal to amend the extent of the Floodplain Overlay District with best available data in the form of updated floodplain maps, as compared to the alternative of waiting for FEMA to adopt maps as FIRMs, is beneficial to the health, safety, and welfare of present and future inhabitants of Boulder County because it provides more accurate hazard information critical for bolstering long term planning and resiliency efforts, and enables land use planning and regulatory actions using the best available data.

Therefore staff determines this criteria is met.

SUMMARY OF PROPOSED TEXT AMENDMENTS (Docket DC-17-0001)

Staff is proposing changes to the floodplain regulations in Article 4-400 (FO District). Changes focus on clarifying existing processes for adopting floodplain data into the Boulder County Floodplain and Floodway. Additional clarifying, clerical or clean-up amendments, and several substantive changes to Article 4-400 were identified by staff during the revision process, in order to best protect the health, safety, and welfare of Boulder County residents in the event of future flood events.

The redlined amendments (all proposed text changes) are included as Exhibit D. A summary table of the proposed clarifying, clerical or clean up, and substantive text changes is included in Exhibit E1. Descriptions and rationale for select substantive changes are included in Exhibit E2.

ARTICLE 16-100(B) TEXT AMENDMENT CRITERIA

Article 16-100(B) contains the criteria for amending the text of the Land Use Code. Staff finds that these criteria are met in the context of Docket DC-17-0001, as follows:

1) The existing text is in need of amendment;

Staff finds that text changes to Article 4-400 of the Land Use Code are needed to facilitate adoption of best available floodplain mapping data into the Boulder County Floodplain and Floodway. Staff also finds that there are other provisions of Article 4-400 that are in need of revision, reorganization, and clerical, or clean-up amendments

to create a clear regulatory framework which better protects the health, safety, and welfare of County residents and addresses the public's need for more easily understood floodplain regulations.

Staff finds that this criteria is met.

2) The amendment is not contrary to the intent and purpose of this Code;

Staff finds that the proposed Article 4-400 text amendments are consistent with and in furtherance of the stated intent and purpose of Article 4-400 of the Land Use Code, Floodplain Overlay District:

Section 4-401, Purpose, *' …. to protect life, property, and health; to ensure the best available data is used in making development decisions; …'.*

Therefore staff determines that this criteria is met.

3) The amendment is in accordance with the Boulder County Comprehensive Plan;

Staff finds that the proposed text amendments are in accordance with the Boulder County Comprehensive Plan, Natural Hazards Element, Goals, Policies, & Maps including:

- Natural Hazard Goal L.1: *'Inappropriate development in natural hazard areas should be reduced as much as possible or eliminated in order to minimize potential harm to life, health, and property'*
- Natural Hazards Policy NH4.01: *'The county should strongly discourage and strictly control land use development from locating in designated floodplains, as identified in the Boulder County Zoning Maps'*

These text amendments are necessary to enable the adoption of best available floodplain data on to the Boulder County Zoning Maps, thereby reducing as much as possible inappropriate development in the floodplain.

Therefore staff determines that this criteria is met.

REFERRAL, PUBLIC NOTICE, AND INVOLVEMENT (Z-17-0001 and DC-17-0001)

Ongoing collaboration between Boulder County, CWCB, and FEMA has been a key component of this remapping project:

- As draft maps were being developed, County staff attended quarterly meetings hosted by CWCB, which were for the purpose of updating local communities on the progress of CHAMP. County staff also provided feedback to CHAMP on local issues (such as the timing of road reconstruction in Boulder County) and community outreach needs (such as notifying residents when surveying was about to take place);
- Frequent coordination between the three agencies on the map amendments under consideration for Docket Z-17-0001 began with the presentation of the CHAMP draft Phase 1 mapping to Boulder County on October 21, 2016;
- CWCB and often FEMA representatives were present at each of the five public map review meetings held December 2016-February 2017; and
- CWCB and FEMA have been involved in the development and technical review of draft data and models, in their appropriate capacities, given that CWCB has

developed the Phase 1 CHAMP maps that have now been formally submitted to FEMA.

In addition, County staff sent a referral to, and held a virtual meeting on March 28, 2017, with FEMA and CWCB representatives to discuss the proposed local adoption of the CHAMP-based floodplain mapping and the proposed amended floodplain regulations. Neither agency had conflicts with the proposed map amendments and proposed Land Use Code regulations as drafted and both supported the changes.

Additionally, throughout the consideration of the proposed text and map amendments, beginning with authorization of DC-15-0004, representatives of multiple County departments have been coming together approximately once a month to discuss progress and to provide feedback on the project, including community outreach. This staff-level internal advisory team has learned about and advised the remapping project as it has progressed. Team members have served as liaisons to their respective departments to assist with various aspects of implementation, including preparing County staff and systems to respond to inquiries from affected Boulder County residents. The team has included representatives of the Transportation Department's GIS team, County Assessor's office, the Land Use Department's planners and GIS team, the County's Flood Recovery Manager, and the Office of Emergency Management (OEM).

Notification of the proposed comprehensive zoning map amendments for Docket Z-17-0001 and the proposed text amendment for Docket DC-17-0001 has been made in a variety of ways, including:

1. Establishment of a floodplain remapping project website (over 2,700 unique visits) and docket webpage;
2. Floodplain remapping newsletters (four editions, each distributed to between 300 and 1,000 email addresses);
3. Creation of a web map for comparison of current regulatory and proposed regulatory floodplain zones (over 4,800 total visits);
4. Public map review meetings (5 meetings, 1,634 postcard notifications mailed, approximately 200 attendees);
5. Public Notice and news release for January Planning Commission Study Session;
6. Boulder County Planning Commission Public Hearing, April 19, 2017 (1,668 postcard notifications mailed; 3,377 email notifications, and news release expected on April 13th); and
7. Boulder County Board of County Commissioners Public Hearing, May 16, 2017 (public notice on May 1st, news release and over 3,300+ email notifications expected on May 9th).

Additional details of the public notice and involvement process are provided in Exhibit B.

PUBLIC COMMENT – (Z-17-0001 and DC-17-0001)

Multiple opportunities existed for property owners to provide comments on the CHAMP Phase I draft mapping and proposed zoning and Land Use Code amendments:

- An online comment form linked to the project website

- A comment tool linked to the web map, where draft maps are displayed
- At public map review meetings
- By email
- By telephone
- At the Planning Commission Public Hearing on April 19th

Comments and community input received throughout the Phase I draft map outreach period prior to March 14, 2017, including the CHAMP team's disposition of those comments that were technical in nature, are compiled in Exhibit F. The public will have another opportunity to review Phase I maps and provide comments or appeal the mapping during the formal FEMA appeal period beginning after the County receives preliminary FIRMs, expected in January 2018.

Public comments regarding the draft mapping received since the close of the aforementioned outreach period are also included in Exhibit F along with staff responses. These comments will be transmitted to the CHAMP team for review, based on the location in question, for either the Phase I preliminary FIRM appeals processing period or during the draft mapping review period for Phase II of the CHAMP study.

Between the January 2017 authorization for dockets Z-17-0001 and DC-17-0001 and the May 9th, 2017 posting of this staff recommendation, no comments have been received that specifically address the approval of either docket; neither the proposed adoption of the best available data into the Boulder County Floodplain nor the language of the proposed text amendments to Article 4-400.

PLANNING COMMISSION– (Z-17-0001 and DC-17-0001)

The Planning Commission held a public hearing for these dockets on April 19, 2017. On that date, the Planning Commission voted unanimously (7-0) to approve and recommend approval of the dockets to the Board of County Commissioners.

CHAMP PHASE II

The staff request for authorization to proceed with Docket Z-17-0002 will allow the above-outlined activities to be carried out again for the second round of map amendments that are anticipated in early 2018 for different stream reaches throughout Boulder County. Staff anticipates presenting proposed map amendments to the Planning Commission at a legally noticed public hearing in spring/summer 2018. A Board of County Commissioners public hearing would follow after Planning Commission provides a recommendation on the docket.

STAFF RECOMMENDATION

Local adoption of best available data in the form of updated floodplain maps, through the proposed zoning map amendment and code revision, as compared to the alternative of waiting for FEMA to adopt maps as FIRMs, provides more accurate hazard information critical for bolstering long term planning and resiliency efforts, and enables land use planning and regulatory actions using the best available data. Use of the more accurate information prior to final adoption by FEMA allows County staff to better protect the health, safety, and welfare of the residents of and visitors to Boulder County in a more timely and transparent manner.

1. STAFF RECOMMENDS THAT THE BOARD OF COUNTY COMMISSIONERS APPROVE Docket Z-17-0001: Zoning Map Amendments to the Floodplain Overlay District and Docket DC-17-0001: Land Use Code text amendments to the floodplain regulations.

Staff recommends an effective date of the new zoning map amendments and regulations of June 1, 2017.

2. STAFF RECOMMENDS THAT THE BOARD OF COUNTY COMMISSIONERS AUTHORIZE STAFF TO PROCEED WITH Docket Z-17-0002: Zoning Map Amendments for CHAMP Phase II Mapping in which the second phase of CHAMP and related flood study projects can be analyzed for proposed zoning map amendments to the Floodplain Overlay District.

Attachments:

- Exhibit A: Best Available Information: A Tool for Your Community to Reduce Flood Risk (FEMA and the State of Colorado, 2017)
- Exhibit B: List of public notice and involvement activities
- Exhibit C: Description of interactive floodplain web map
- Exhibit D: Redlined amendments to Land Use Code Article 4-400
- Exhibit E: Summary table of proposed code changes (E1) and description of select substantive proposed code changes (E2)
- Exhibit F: List of public comments received on draft floodplain mapping

Exhibit A:

Best Available Information: A Tool for Your Community to Reduce Flood Risk (FEMA and the State of Colorado, 2017)

Best Available Information

A Tool for Your Community to Reduce Flood Risk

FEMA and the State of Colorado

What is best available information?

The Federal Emergency Management Agency (FEMA) defines Best Available Information (BAI) as either:

- The existing flood hazard information adopted by a community and reflected on an effective Flood Insurance Rate Map (FIRM), Flood Boundary and Floodway Map and/or within a Flood Insurance Study report; or
- Draft or preliminary flood hazard information supplied by FEMA or from another source and reasonably used by the community.

In general, when draft or preliminary information is available, only that information which consists of more restrictive 1% annual-chance (100-year) flood discharges, flood hazard zone boundaries (including floodways), and water-surface elevations shall be considered BAI, so long as it meets FEMA's technical and accuracy standards.

Why is best available information important for Colorado communities?

BAI is an important component of local floodplain management because it represents the most suitable flood hazard information for performing community planning, engineering, development review, permitting, and emergency management functions, and helps communities become more hazard-resilient by working towards the following floodplain management goals:

- protection of life, health, and property
- protection of public and private infrastructure
- improving public flood risk awareness
- reduction in rescue and relief efforts
- reduction of economic and social hardships
- compliance with minimum National Flood Insurance Program (NFIP) Standards
- lower flood insurance premiums

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

FEMA

How can my community use this data?

First, check the local codes and ordinances. Your community may have to go through a local adoption process before the data can be used to make planning, permitting, and development review decisions. Otherwise, you can use the new data starting immediately. The ways in which this data can be applied are almost limitless. We encourage you to think of unique ways your community can put this data to work, and have provided a few examples below.

- Zoning district updates
- Land use code/ordinance updates
- Permitting
- Community Rating System points
- Mitigation project planning
- Grant applications
- Stormwater management and design
- Flood evacuation route planning
- Reverse 911 system updates
- Emergency shelter planning
- Capital Improvement Project planning
- Outreach applications
- Social Vulnerability analyses

For an example of how adopting higher regulatory standards can benefit your community, check out the case study that was conducted after the 2013 flood event in Colorado.

For more information on how your community can use BAI to guide development in potential and established flood areas, please visit the FEMA website at https://www.fema.gov/use-flood-insurance-study-data-available-data.

What qualifies as "reasonable" use of draft or preliminary flood hazard information?

The concept of 'reasonable' ensures that use of the data would not be detrimental to a proposed development or to the community's standing within the NFIP. FEMA specifies that draft or preliminary information should be used in cases where it is more restrictive [i.e., where there are discharges, floodplain boundaries, or increasing Base Flood Elevations (BFEs)] when compared to the current effective information. FEMA prohibits its use when discharges or BFEs are decreasing when compared to the current effective information. This is because draft or preliminary information has not been through a formal appeal period and is subject to change. After draft or preliminary information proceeds through a formalized appeal process, any appeals have been resolved, and a final notice has been provided to the community through issuance of a Letter of Final Determination (LFD), the information is required to be used for floodplain management decisions, not for 'reasonable' use.

In Zones B, C, or X:
There is no requirement for a community to use the draft or preliminary flood risk data in these zones. FEMA does, however, encourage communities to reasonably use this information to help meet the floodplain management goals outlined on Page 1.

In Zone A:
Local officials are required by the NFIP regulations to reasonably utilize draft or preliminary flood risk data as BAI to manage development in Zone A areas. Examples of ways BAI must be used in Zone A areas are:

1) Use BAI to determine the required minimum elevation of the first floor, HVAC, electric, and plumbing fixtures for new residential construction/substantial improvements.
2) Use BAI to identify floodway boundaries, which can impact permitting submittal requirements for proposed development projects (proposed projects in the floodway must, at a minimum, demonstrate through hydraulic modeling that they will not result in any increase greater than 0.00 feet in 1-percent-annual-chance (100-year) water-surface elevations.

In Zone AE, A1-30, AH, and AO:
FEMA encourages communities to reasonably utilize draft or preliminary flood risk data in instances where it provides more restrictive 100-year flood discharges, flood hazard zone boundaries (including floodways), and water-surface elevations to ensure the floodplain management goals outlined on page 1 are met. The community cannot use the less restrictive data to regulate development until a LFD has been issued. Use of less-restrictive draft or preliminary flood hazard information prior to the issuance of a LFD may result in significantly higher flood risk to people and property if the data changes before it is finalized. Additionally, it may result in higher flood insurance premiums, and the community may be in violation of their locally-adopted Flood Damage Prevention Ordinance.

Using factors such as years of gage record, amount of development, and presence of new hydraulic structures, FEMA has inventoried many of the effective detailed study areas (Zone AE, A1-30, AH, AO, VE, and V1-30) to determine if the study information presented on the current effective FIRM is still a reasonable representation of flood risk. In areas where validated studies exist, these studies should take precedent over Large-Scale Automated Engineering or Base-Level Engineering studies.

For more on the application of BAI in different flood risk zones, refer to FEMA Policy #104-008-2 https://www.fema.gov/use-flood-insurance-study-data-available-data.

How does this data help me with disaster response and recovery activities?

BAI should be used to help plan and implement response activities such as creating evacuation zones, evacuation routes, emergency shelters, and emergency notification systems like Reverse-911.

Flood recovery projects funded by all Federal and most state grant programs must use BAI as the basis for design, unless a local design standard is more restrictive. An example of this is FEMA Public Assistance. The following is an example scenario which demonstrates how this data can be used:

- A public vehicular bridge on a county road is destroyed during a large flood event. Once the bridge is replaced, the county intends to apply for reimbursement through the Community Development Block Grant- Disaster Recovery program.
- Following the flood event, a state agency developed an updated 100-year flood discharge at the bridge (2,400 cfs), which turned out to be lower than the current effective flood discharge (3,100 cfs).
- The county's bridge design consultant must use the BAI to design the replacement bridge. In this case, the BAI is the higher of the 2 discharges; therefore, the bridge must be designed using the higher discharge of 3,100 cfs.

Additionally, much like its application to new construction and substantial improvements, BAI can be used to regulate repair of substantial damage. For example:

- A home has been determined to be 60 percent damaged (when compared to current market value) by a recent flood event. The current effective flood risk zone for the home is Zone AE and the current effective BFE is 1,110.0 feet NAVD88.
- Following the flood event, a draft Base-Level Engineering study completed by FEMA shows that the 100-year water-surface elevation at the home is approximately 1,112.0 feet NAVD88. This study should be considered the BAI for this specific home.
- Because the home was substantially damaged, during repair the first floor should be elevated to the higher of the two available BFEs, which is 1,112.0 feet NAVD88, plus any additional freeboard regulated by the local community.

What about other grant programs that are not related to flood recovery?

The requirement to use BAI applies to any Federal or state grant program.

How can I leverage this data to update my mitigation plan and/or apply for a mitigation project?

Mitigation planning relies on having quality data available to prioritize, design, and implement mitigation projects. In most cases, the highest-quality data will be synonymous with BAI. Good hazard mitigation plans will have procedures built in to account for updates to flood risk information. If BAI is available, local planners should use this information in conjunction with projects identified in the plan to determine if the project priority and design is still appropriate considering the hazard and risk identified with the BAI. In addition, as mitigation projects are funded, their designs should consider the best flood hazard information available at the time of design.

Furthermore, incorporating BAI into risk assessment tools or computer programs, such as Hazus, can produce more-refined flood loss information. These results can be directly incorporated into the local hazard mitigation plan or used for operational and response planning.

Can Best Available Information be used to submit a Letter of Map Change (LOMC)?

For Letters of Map Amendment (LOMAs)/Letters of Map Revision based on Fill (LOMR-Fs): In Zone A areas, BAI can, in some cases, be used to support a request to remove a structure, property, or portion of property from the Special Flood Hazard Area. The BAI study information should be submitted to FEMA with the LOMA/LOMR-F application, where it will be reviewed to determine whether it meets certain technical and accuracy standards in order to be used to process the LOMA/LOMR-F. In detailed flood risk zones such as Zone AE areas, however, FEMA must use the current effective BFEs compared to structure and/or property elevations to determine if that structure and/or property is eligible for a LOMA or LOMR-F.

For Letters of Map Revision (LOMRs): In certain instances, a draft study can be submitted to FEMA with a LOMR application. If the data is obtained from a source other than FEMA, FEMA will review the draft study information to determine whether it meets certain technical and accuracy standards in order to be published as effective information. Should FEMA determine that additional data is necessary, it may be up to the community to submit the additional data.

Can Best Available Information be downloaded and incorporated it into my local GIS software?

Yes. These days, most draft or preliminary study information is provided in digital/GIS format. FEMA encourages the use of BAI in-conjunction with other digital datasets to enhance floodplain management decision making. Examples of other digital datasets to pair with BAI include:

- Aerial imagery
- Local transportation data
- Zoning/land use information
- Building footprints
- Parcel boundaries
- Critical facility locations
- U.S. census bureau information

Who can I contact for more information?

For questions about specific applications of this data in your community, contact your State NFIP Coordinator, Stephanie DiBetitto at stephanie.dibetitto@state.co.us, 303-866-3441, ext. 3221 or Matt Buddie, the NFIP Specialist for FEMA Region VIII at matthew.buddie@fema.dhs.gov, 303-235-4730.

Exhibit B: Listing of public notice and involvement

PUBLIC NOTICE AND INVOLVEMENT (Z-17-0001 and DC-17-001)

1) **Floodplain Remapping Project Website:**
   a. Since the Floodplain Remapping Project homepage was created in May 2016, there have been over 2,700 unique visits to the site (as of May 8, 2017).
   b. March 29, 2017 – Notice of major website updates sent via email to 1,364 email addresses comprising the Boulder County Floodplain Remapping ListServ and Land Use Code ListServ
2) **Boulder County Floodplain Remapping Newsletters:**
   a. May 5, 2016 – Notice of the first edition of the Boulder County Floodplain Remapping Newsletter sent via mail to 395 addresses throughout the Phase I stream reaches. Newsletter was posted to the Floodplain Remapping Project homepage.
   b. July 1, 2016 – Notice of the second edition of the Boulder County Floodplain Remapping Newsletter sent via email to 236 email addresses comprising the Boulder County Floodplain Remapping ListServ. Newsletter was posted to the Floodplain Remapping project homepage.
   c. December 6, 2016 – Notice of the third edition of the Boulder County Floodplain Remapping Newsletter sent via email to 374 email addresses comprising the Boulder County Floodplain Remapping ListServ. Newsletter was posted to the Floodplain Remapping Project homepage.
   d. February 17, 2017 – Notice of the fourth edition of the Boulder County Floodplain Remapping Newsletter sent via email to approximately 1,069 email addresses comprising the Boulder County Floodplain Remapping ListServ and Land Use Code ListServ. Newsletter was posted to the Floodplain Remapping Project homepage.
3) **Interactive Web Map of Draft and Regulatory Floodplain Mapping:**
   a. April 6, 2017 – updated layers for consideration by the Planning Commission were published to the web map
   b. Since it was created in December 2016, there have been over 4,800 total visits to the site (as of May 8, 2017)
4) **Public Meetings:**
   a. December 13, 2016 – Public Meeting in Lyons, Colorado for draft map review addressing portions of the South, North, and Main Stem of the St. Vrain
      - December 2, 2016 – Postcards sent to 150 landowners along Dec. 13 meeting stream reaches
      - December 6, 2016 – News release for the Dec. 13, 2016 public meeting published by Boulder County and posted in the Daily Camera
   b. January 10, 2017 – Public Meeting for draft map review of Fourmile Canyon Creek (above Wagonwheel Gap Road), Dry Creek #2, New Dry Creek, Resilient St. Vrain Study Area
      - December 28, 2016 – Postcards sent to 512 landowners along Jan. 10 meeting stream reaches
      - January 4, 2017 – News release for the Jan. 10 and Jan. 19 public meetings published by Boulder County
   c. January 19, 2017 – Public Meeting for draft map review of Cabin Creek and North/Middle/South St. Vrain creeks between CO Hwy 72 and Longmont Dam Road
      - January 4, 2017 – News release for the Jan. 10 and Jan. 19 public meetings published by Boulder County
      - January 11, 2017 – Postcards sent to 347 landowners along Jan. 10 meeting stream reaches
   d. January 31, 2017 – Public Meeting for draft map review of Two Mile Canyon Creek, Lower Boulder Creek east of 61st Street, South Boulder Creek from Gross Reservoir to Eldorado Springs townsite, Boulder Creek from Barker Reservoir to upstream of Eben G. Fine Park, Rock Creek, and Coal Creek
      - January 20, 2017 – Postcards sent to 334 landowners along Jan. 31 meeting stream reaches
      - January 24, 2017 – News release for the Jan. 31 and Feb. 14 (later rescheduled to Feb. 23) public meetings published by Boulder County

e. February 23, 2017 – Public Meeting for draft map review of all previously discussed reaches plus North Boulder Creek from CO Hwy 72, Middle Boulder Creek from west of Eldora to Nederland, and South Boulder Creek from the southern county line to Gross Reservoir
   - February 10, 2017 – Postcards sent to 291 landowners along Feb. 23 meeting stream reaches (North, Middle, and South Boulder Creeks)
   - February 16, 2017 – News release for the Feb. 23 public meeting published by Boulder County and sent via email to 3,377 email addresses comprising the Boulder County Floodplain Remapping, Flood Recovery, and Land Use Code ListServs
   - March 16, 2017 – Follow-up postcard sent to Feb. 23 stream reach landowners to invite individuals to schedule office visits to review mapping as inclement weather prevented many from attending the Feb. 23 meeting

5) Study Session:

a. January 18, 2017 – Boulder County Planning Commission Study Session in Preparation for Boulder County Floodplain Remapping Adoption Process
   - Authorization for staff to proceed with analysis into zoning map amendments was received from the Board of County Commissioners on Jan. 10, 2017
   - A video recording of the Jan. 18 study session is available on the Boards & Commissions website and the Floodplain Remapping Project 'Staying Informed' webpage.

6) Public Hearings:

a. January 19, 2017 – Docket information including project background posted to the docket webpage at: http://www.bouldercounty.org/property/build/pages/lucodeupdatedc170001.aspx
b. April 4, 2017 – Public notice for April 19 Boulder County Planning Commission Hearing was sent via email to 1,364 email addresses comprising the Boulder County Land Use Code ListServ. The notice indicated the opportunity for public comment to be heard at the hearing.
c. April 10, 2017 – Postcards sent to 1,668 landowners along all CHAMP Phase I stream reaches included in zoning map amendment Z-17-0001.
d. April 12, 2017 – Docket information including staff's formal recommendation to the Planning Commission was posted to the docket webpage at http://www.bouldercounty.org/property/build/pages/lucodeupdatedc170001.aspx
e. April 13, 2017 – News release announcing the Planning Commission public hearing for the Floodplain Remapping Project published by Boulder County and sent via email to 3,377 email addresses comprising the Boulder County Floodplain Remapping, Flood Recovery, and Land Use Code ListServs
f. April 19, 2017 – Public hearing before the Boulder County Planning Commission. Public testimony was taken at this hearing.
g. Anticipated May 9, 2017 – News release announcing the Board of County Commissioners public hearing for the Floodplain Remapping Project published by Boulder County and sent via email to over 3,300 email addresses comprising the Boulder County Floodplain Remapping, Flood Recovery, and Land Use Code ListServs
h. Anticipated May 16, 2017 – Public hearing before the Board of County Commissioners. Public testimony will be taken at this hearing.

Exhibit C: Description of interactive floodplain web map

VISUALIZING FLOODPLAINS IN BOULDER COUNTY

As Boulder County prepares to adopt new floodplain mapping through Phase I of the state's Colorado Hazard Mapping Program (CHAMP), a new map has been added to the county's interactive web map to show the areas of unincorporated Boulder County that have proposed floodplain mapping changes, the levels of flood risk throughout the Phase I reaches, and how the proposed Phase I mapping intersects with current regulatory floodplain zones.

USING THE INTERACTIVE WEB MAP

The interactive web map exists to make it easier to understand the mapping updates happening throughout unincorporated Boulder County after the 2013 flood event. The site was established when Boulder County received draft mapping from CHAMP for the Phase I study in late 2016. "Draft" layers shown on the map refer to the CHAMP study data, while the "Proposed Regulatory" layer refers to the proposed changes to the current Floodplain Overlay zoning district ("FO District") based on the best available data (including CHAMP data) for predicting flood risk and high hazard areas. 500-year floodplain areas from the CHAMP study are only shown to be included in the "Proposed Regulatory" floodplain layer when they overlap with "Current Regulatory" areas that must be maintained. Draft and Proposed layers are subject to change – see *What Changes are Happening?* for more details.

Accessing the Map:

- From the bouldercounty.org homepage, find *'Property & Land'* in the main heading and then go to *'Floodplain Management'* in the drop-down window that appears. You'll see a link for *'Floodplain Remapping in Boulder County.'* Visit this page to access the web map and learn more about the Floodplain Remapping Project.

MAP LAYERS ON THE WEB MAP:

- **Comment Points**
- **Under Review for Phase II Study**
- **Draft CHAMP Cross Sections**
- **Current Regulatory Base Flood Elevations**
- **Current Regulatory Cross Sections**
- **Proposed Regulatory Flood Risk Zones**
  - Proposed 100-yr Floodplain (includes FEMA and CHAMP Zones AE, A, AO, and AH)
  - Proposed Floodway (includes full extents of CHAMP floodplain above 6,000 ft. elevation)
- **Draft CHAMP Flood Risk Zones**
  - Floodway, 100-yr & 500-yr Floodplains
- **Current Regulatory Flood Risk Zones**
  - FEMA Floodway, 100-yr & 500-yr Floodplains (Zones AE, A, AO, and AH)
  - Boulder County Floodway, 100 year & 500 year Floodplains (Zones AE, A, AO, and AH)

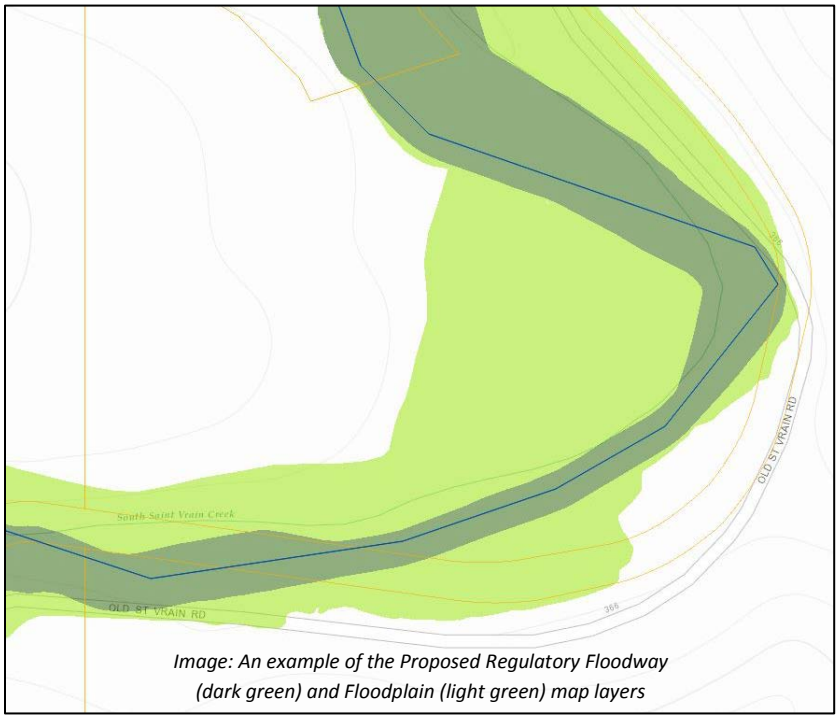
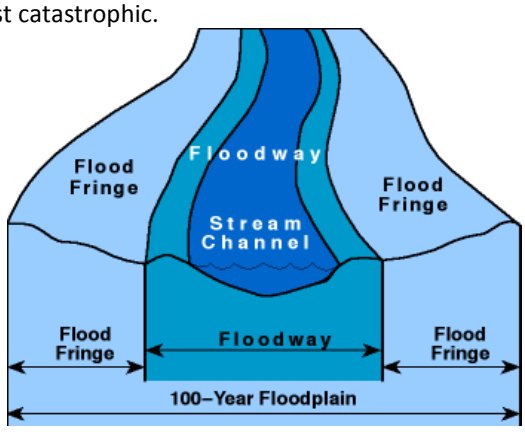


Image: An example of the Proposed Regulatory Floodway (dark green) and Floodplain (light green) map layers

WHAT IS THE FLOODWAY?

The floodway represents the most hazardous portion of the floodplain, where flood depths and velocities are greatest and damages resulting from flooding are the most catastrophic.



WHAT CHANGES ARE HAPPENING?

Areas already within the regulatory FO District are not being changed. The "Proposed Regulatory" layer shows the extents of the CHAMP study and other best available data being proposed as revised FO District. The web map allows current and proposed layers to be viewed separately for comparison, or together as a composite all FO District areas.

The new mapping is subject to review by the County Planning Commission and approval by the Board of County Commissioners. The final proposed mapping will be posted to the web map no later than one week prior to the scheduled Planning Commission hearing. Upon approval by the Board of County Commissioners, the proposed mapping will become official FO District for regulatory purposes. However, no impacts to flood insurance will occur until FEMA officially adopts the maps, expected in early 2019.

Upon adoption, the FO District Official Map with the detailed regulatory zones will be available on the county's website and conveniently accessed via a link in the *Floodplain* tab on the Boulder County Assessor's Property Search map.

Exhibit D: Redlined amendments to Land Use Code Article 4-400

4-400 Floodplain Overlay District

4-401 Purpose

A. To provide land use controls necessary to qualify unincorporated areas of Boulder County for flood insurance under requirements of the National Flood Insurance Act of 1968, as amended; to protect life, property, and health; to ensure the best available data is used in making development decisions; to avoid increasing flood levels or flood hazards or creating new flood hazard areas; to minimize public and private losses due to flooding; to reduce the need for expenditures of public money for flood control projects; to reduce the need for rescue and relief efforts associated with flooding; to prevent or minimize damage to public infrastructure, facilities, and utilities; and to meet or exceed FEMA and CWCB minimum standards for floodplain regulation.

B. FEMA requires all communities that participate in the National Flood Insurance Program ("NFIP") regulate "Development" that occurs within the Special Flood Hazard Area. FEMA defines Development as "any manmade change to improved and unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating or drilling operations."

4-402 Applicability and Administration

A. **Applicability.** The Article 4-400 applies to all lands in the Floodplain Overlay ("FO") District. If a lot or other parcel of land lies partly within the FO District, this Article 4-400 applies to the part of such lot or parcel lying within the district. If a building or structure lies partly within the FO District, then this Article 4-400 applies to the entire building or structure.

B. **County Engineer Role.** The County Engineer or his or her designee is responsible for the administration and implementation of the requirements of the FO District, including reviewing all development proposals to determine the applicability of this section, all Individual Floodplain Development Permit ("Individual FDP") applications, and all notifications submitted for General Floodplain Development Permit ("General FDP") consideration.

C. **No Liability.** The degree of flood protection provided by this section has been determined to be reasonable for regulatory purposes and is based on engineering and scientific methods of study of the 1%-annual-chance (100-year) flood event, also referred to as the base flood. Floods of greater magnitude may occur. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge or culvert openings restricted by debris. This Article 4-400 does not imply that land areas outside of 100-year floodplain boundaries or land uses

permitted within such areas will be free from flooding or flood damages, or that compliance with these regulations will prevent flood damage. Neither Boulder County nor any of its officers or employees shall be liable for any flood damages, including any damages that result from reliance on this article or any administrative decision.

D. **More Restrictive Prevails.**

1. The Federal Emergency Management Agency ("FEMA") and the Colorado Water Conservation Board ("CWCB") have established certain minimum standards for regulatory floodplains. To the extent a FEMA or CWCB requirement conflicts with a provision in 4-400, the most restrictive controls.
2. This Article 4-400 does not repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. Where this Article 4-400 and another ordinance, easement, covenant, or deed restriction conflict or overlap, the more restrictive applies.

E. **Permits Required.**

1. All development in the FO District requires an Individual FDP or must be covered by the General FDP. Development in the FO District not covered by a General FDP or an Individual FDP may result in enforcement action under Article 17.
2. In addition to the Floodplain Development Permits required by this section, all required local, state, and federal permits must be issued prior to development in the FO District.

F. **Referral from Other County Departments.**

1. All development that requires a planning review process through the Boulder County Land Use Department and may be susceptible to flooding will be forwarded to the County Engineer for review and comment. The County Engineer must determine if the work is covered under a General FDP, requires an Individual FDP, or does not require any type of Floodplain Development Permit. Where the County Engineer indicates that the development will need a Floodplain Development Permit, the Land Use Department should note the requirement on any planning approval.
2. All building permit applications shall be reviewed by the Building Division to determine whether the proposed development is potentially within the FO District and therefore may require a Floodplain Development Permit. If it appears to the Chief Building Official that any proposed development may be within the FO District, then the Chief Building Official shall refer the application to the County Engineer. The Chief Building Official shall not issue a building permit when floodplain issues have been raised unless the County Engineer has confirmed the development is approved

under a General FDP or an Individual FDP or the County Engineer has determined that a Floodplain Development Permit is not required.

3. All Onsite Wastewater Treatment System ("OWTS") applications will be reviewed by Boulder County Public Health Department ("Public Health") to determine whether the work, including new OWTS or repair/replacement of an existing OWTS, may be within the FO District. If it appears to Public Health that the proposed work may be within the FO District, then Public Health must refer the application to the County Engineer. Public Health must not issue an OWTS permit when floodplain issues have been raised unless the County Engineer has issued an Individual FDP or has determined that no such permit is required.

4-403 FO District Defined; Official Map

A. **FO District.** The Boulder County FO District is defined as the FEMA Floodplain together with the Boulder County Floodplain, as those floodplains are defined below.

1. The December 18, 2012 Digital Flood Insurance Rate Map ("DFIRM") and Flood Insurance Study ("FIS") report published by FEMA, as amended, is incorporated by reference. The DFIRM and FIS in effect on the date of a property owner's complete application for any permit or process in this Code, in particular those portions of the DFIRM and FIS that define the 100-year floodplain, is the foundational floodplain for the FO District (the "FEMA Floodplain"). The term "DFIRM" includes all flood risk zone designations and technical information displayed on the maps, explanatory matter, technical addenda, modeling and calculations, water surface elevations, profiles, and cross sections, and other underlying detailed study data, such as information published in the FIS report and supporting documentation, as well as approved Letters of Map Revision ("LOMR"), Letters of Map Amendment ("LOMA"), and Letters of Map Revision based on Fill ("LOMR-F"). The FEMA Floodplain includes Zone AE, A, AH, and AO flood risk zone designations, including both Floodway and Flood Fringe areas.

2. To augment the FEMA Floodplain, the Board of County Commissioners may, after review and recommendation by the Planning Commission, adopt a "Boulder County Floodplain." The purpose of adopting a Boulder County Floodplain is to facilitate use of the best data available to the County to establish floodplain boundaries, Base Flood Elevations ("BFE"), and Flood Protection Elevations ("FPE") to better protect residents of the County from flood hazards.

    a. The Boulder County Floodplain must be comprised of the same flood risk zone designations as the FEMA Floodplain.

b. In no instance may the Boulder County Floodplain remove from the FO District an area or property designated as within the FO District by the FEMA Floodplain.

c. The following reports, maps, and related information constitute~~s~~ the ~~initial~~ location and boundaries of the current Boulder County Floodplain:

(i) ~~Floodplain Re-analysis and Floodway Delineation, North St. Vrain and St. Vrain Creeks, Boulder County, CO, by Love & Associates, Inc., October, 1992; and~~Any flood hazard or flood delineation report as adopted by the Board of County Commissioners in accordance with Article 4-1100 depicted on the Boulder County Floodplain official digital map.

~~(ii) Any area included in the definition of Floodway per Section 4-414.~~

d. The maps in these reports~~, as well as the area described in the Floodway definition,~~ depicting the floodplain for the base flood shall be considered the official maps for the purposes of locating the Boulder County Floodplain on the official zoning district maps. These maps and reports, together with all amendments, explanatory matter, technical addenda, water surface elevations, profiles and cross sections (where available) are incorporated by reference into this Code.

3. All records pertaining to floodplain development must be on file with the County and open to public inspection. These records include, but are not limited to, certified Lowest Floor Elevations, Elevation Certificates, commercial Floodproofing Certificates, LOMAs, LOMR-Fs, LOMRs, Floodplain Development Permits, boundary interpretations, and records of action on variance requests.

B. **Official Map.** The County Engineer shall maintain digital maps delineating the location and boundaries of the FEMA Floodplain and the Boulder County Floodplain. The FEMA Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as published by FEMA. The Boulder County Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as adopted by Boulder County. These maps of the FEMA Floodplain and the Boulder County Floodplain together establish the areas governed by the provisions of this Article 4-400 and constitute the Official Map of Boulder County's FO District ("Official Map").

1. The most current Official Map and supporting data shall be on file in the County Engineer's Office in electronic format, available for public inspection during normal business hours, with electronic and paper copies available upon request.

The Official Map must also be available to the public on the Boulder County website.

2. The County Engineer shall maintain records of superseded versions of the Official Map for historical reference.

C. Interpretation of Official Maps

1. The County Engineer shall determine which uses, parcels, structures, or other facilities are located in an ~~previously~~ adopted FEMA Floodplain or a Boulder County Floodplain, including in situations where a mapped boundary appears to conflict with actual field conditions. In making such interpretations, the County Engineer shall refer, as necessary, to the best available data at that time.
2. Sources of best available data for interpretations include the engineering study upon which the maps and elevations are based, the professional engineers who prepared the study, the most recent detailed terrain data certified by a P.E. or a P.L.S., survey data certified by a P.E. or a P.L.S., any BFE/water surface elevation, floodway, and other flood risk data available from state or federal agencies, and any other reliable source that the County Engineer finds meets an acceptable level of technical accuracy as determined through prevailing industry practices.
3. The use of aerial photography to interpret FO District boundaries, but without the consideration of local terrain data, shall be for informational purposes only, and not for making determinations as to the exact location of the boundaries of the FO District.
4. If the County Engineer makes a determination regarding the relationship of the Official Map to a use, parcel, structure, or other facility, the interpretation must be noted in the records associated with any related permit(s) and available for public inspection.
5. The County Engineer's determinations under this section are interpretations of precisely where the existing regulatory boundar~~y~~ies lie~~s~~ on the ground. A determination as to which uses, parcels, structures, or other facilities are located in or out of a previously adopted FEMA Floodplain or a Boulder County Floodplain does not itself contract or expand the boundaries of the FO District. Therefore, such determinations do not result in an amendment to the Official Map that requires review and approval by the Planning Commission and Board of County Commissioners.

~~5.~~

D. Amendment of Official Map

1. The FEMA Floodplain within the FO District will be deemed updated when FEMA issues a Letter of Final Determination associated with any map action, or after the effective date of any Letter of Map Change ("LOMC"), without need for review or approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.

    a. If FEMA provides notice of final BFEs and sets an effective FIRM revision date (through issuance of a Letter of Final Determination) for studies that had previously been adopted as Boulder County Floodplain, the following rules apply:

        (i) If FEMA made no changes to the studies previously adopted by Boulder County, then from the effective date of FEMA's map action forward, Boulder County will continue to regulate using those studies to partially define the FO District, but will treat the studies as FEMA Floodplain rather than Boulder County Floodplain. In this circumstance, the County Engineer is not required to obtain review and approval of Planning Commission or the Board of County Commissioners.

        (ii) If prior to its official action FEMA makes changes to maps, data, or related documentation previously included only in the Boulder County Floodplain, the County Engineer must determine whether and how the Boulder County Floodplain should be amended.

2. Except for an automatically adopted DFIRM update, a change in the boundary of the FO District requires review by the Planning Commission and approval by the Board of County Commissioners of a Zoning Map Amendment in accordance with Section 4-1100. The County Engineer shall revise the Official Map upon approval of changes to the Official Map by the Board of County Commissioners.

~~3. If a property owner in the FO District believes that the provisions of this Section should not apply to some or all of the property owner's property because the building or ground elevations are above the corresponding BFE, then (1) as to the Boulder County Floodplain, the owner may request a rezoning map amendment under the procedures of 4-1100, and (2) as to the FEMA Floodplain, the owner may request FEMA approve a (LOMA). LOMAs must be provided to the County Engineer.~~

~~4.~~3. The County Engineer may correct clerical errors in the Official Map as they are discovered, without need for approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.

~~5.~~4. The County Engineer may generate or receive draft and/or preliminary flood risk analyses and reports affecting the FO District. These analyses may be any flood

risk analyses, including those designated by CWCB or distributed by FEMA, as well as any other water surface elevation and/or Floodway data available from state or federal agencies or any other reliable source. Upon notification of such new information, the County Engineer shall evaluate whether a change to the boundaries of the FO District is required. If so, the County Engineer will submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.

5. In accordance with 44 C.F.R. § 65.3 and the Rules and Regulations for Regulatory Floodplains in Colorado (the "CO Floodplain Rules"), project proponents must submit technical data to FEMA in the form of a ~~map revision~~LOMR request within six months of the date of completion of a project if the project received a CLOMR from FEMA before construction ~~-~~or results in changes (either increases or decreases) in the 100-year water surface elevation greater than 0.3 foot.

    a. Map revision requests in existing Floodway areas shall use the Floodway surcharge criteria outlined in 4-404.2(E)(3)

6. The County Engineer will monitor large-scale natural physical changes as they occur. If the County Engineer deems it necessary to restudy a mapped floodplain or floodway as a result of such changes, the County Engineer shall coordinate with CWCB and FEMA and, as appropriate, submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.

4-404 Floodplain Development Permits

A. **Minimum Federal and State Standards.** Development in the FO District must comply with the NFIP and State of Colorado minimum standards. These standards require applicants to demonstrate that those development projects allowed in the Floodway, when combined with all other existing and anticipated development, will not cause an increase in the modeled 1%-annual-chance water surface greater than 0.00 feet and, for projects in the Flood Fringe, will not cause an increase greater than 0.50 feet.

B. **Uses Prohibited in Floodway.** The floodway depicts the portion of the floodplain where flood depths and velocities are greatest, risk to health and safety is highest, and damages resulting from flooding are the most catastrophic. The following activities and uses are prohibited within all ~~mapped~~ Floodways~~s~~:

1. Construction of new permanent buildings (either residential or non-residential) with the exception of relocated nonconforming uses otherwise permitted by this Article 4-400;

2. Construction of new temporary buildings (either residential or non-residential), unless the County Engineer reviews and approves a specific location in the Floodway in conjunction with a Special Event as defined in the Multimodal Transportation Standards, a Group Gathering / Special Event as defined in the Land Use Code, or another temporary activity permitted by county regulations;
3. Construction of additions to existing buildings that increase the building's square footage, footprint, or Habitable Space;
4. Conversion of existing accessory use space to living or primary use space;
5. Overnight campgrounds;
6. Dispersed camping, unless the camping is approved through the issuance of a Group Gathering / Special Event Permit as defined in the Land Use Code;
7. Parking of Recreational Vehicles for the purposes of overnight habitation;
8. Storing or processing of materials that are buoyant, flammable, explosive, or otherwise potentially injurious to human, animal or plant life;
9. Solid waste disposal sites and central collection sewage treatment facilities;
10. New or expanded individual on-site wastewater systems, unless the expanded system is required to bring existing buildings up to code or is allowed per 4-405(G)(4);
11. Solid wood fences, chain link fences, or any fence that does not meet the Boulder County standards for fence installation;
12. Any activity or use that would create significant potential for downstream solid debris (including, but not limited to decks) waste, or rubbish;
13. New or expanded Critical Facilities located on land lower than 6,000 feet in elevation; and
14. Any encroachment (including filling and grading) that would adversely affect the efficiency of the Floodway or change the direction of flow, unless it conforms with section 4-404(C).
~~14.~~15. Above-ground oil and gas operations, as defined in Article 12-1400.

C. **Uses Allowed in Floodway under Certain Conditions.**

1. The County Engineer may issue FDPs for the following development types and open uses within the Floodway unless the use (1) is prohibited in the underlying zoning district, (2) adversely affects the efficiency of the Floodway, (3) changes the direction of flow, or (4) poses a significant safety hazard:

a. Agricultural uses involving the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising and grazing of livestock and horses, as well as temporary buildings associated with such use, as detailed in 4-405(C)(3)(c);

b. Uses accessory to residential uses, including, but not limited to lawns, open areas, gardens, driveways, and play areas;

c. Industrial or commercial uses such as loading areas, railroad rights-of-way (but not including freight yards or switching, storage, or industrial sidings), parking areas, and airport landing strips;

d. Recreational uses not requiring permanent or temporary buildings designed as habitable space, unless a special event permit has been issued for a temporary building;

e. Utility facilities such as dams, power plants, spillways, transmission lines, pipelines, water monitoring devices, water supply ditches, irrigation ditches and laterals, and open mining;

f. Hydraulic structures such as bridges, culverts, weirs, diversions, drop structures, and fish ladders, for access and flood or stormwater control; and

g. Critical Facilities above 6,000 feet in elevation, as described in 4-405(D).

2. In addition, the County Engineer may not issue FDPs for the allowed development types and uses listed in 4-404(C)(1) above that result in an encroachment within the Floodway unless the applicant has demonstrated through hydrologic and hydraulic analyses performed by a ~~qualified~~ P.E. ~~licensed~~ registered in the State of Colorado (~~and~~ in accordance with standard engineering practice ~~that the proposed encroachment~~ and the requirements of 4-404.2(E)) that the proposed encroachment is in compliance with the provisions of 4-404.2(E)(4).

3. For Floodway areas above 6,000 feet in elevation, uses other than those described in 4-404(C)(1) above may be allowed at the discretion of the County Engineer if the proposed use or development will occur within an area of ineffective flow,

~~2. would not result in any increase in flood levels within the community during the occurrence of the Base Flood (a No-Rise Certification).~~

~~3. Under the provisions of 44 CFR Chapter 1, Section 65.12, of the NFIP Regulations, a community may permit encroachments within the adopted FEMA regulatory Floodway that would result in an increase in BFEs if the applicant first receives an approved CLOMR and/or Floodway revision from FEMA.~~

~~4. Where there is a designated FEMA Floodplain but no designated FEMA Floodway, and there is a designated County Floodway, projects that result in increases greater~~

~~than 0.5 foot in these areas must first receive an approved CLOMR from FEMA, and projects that result in increases between 0.0 and 0.5 foot in these areas must first receive an approved Boulder County Floodway Review from the County Engineer.~~

5. ~~Where there is no designated FEMA Floodplain, but there is a designated County Floodway, projects that result in any increase in these areas must first receive an approved Boulder County Floodway Review from the County Engineer.~~
6. ~~Where there is a designated FEMA Floodplain, and no FEMA or County Floodway, projects that result in increases greater than 0.5 foot must first receive an approved CLOMR from FEMA.~~
7. ~~Where there is no designated FEMA Floodplain, but there is a designated County Floodplain (but not a County Floodway), the procedure set forth in 4-404.2(E) (Procedures for Modeling Proposed Development within the Floodway) must be followed.~~
8. ~~For all new subdivision proposals and other developments (including, but not limited to, manufactured home parks) greater than either 50 lots or 5 acres that are located in Zone A, this analysis must also depict, as a part of the development proposal, the BFEs that Boulder County will use to determine FPEs for the proposed development.~~
9. ~~In all instances, no increases in water surface elevation will be allowed that impact an insurable building.~~
10. ~~Following project completion, the County Engineer shall provide FEMA with all information required by 44 C.F.R. Part 65 relating to water surface elevation changes so that FEMA may determine whether a map revision is appropriate.~~

D. **Uses Allowed in Flood Fringe under Certain Conditions.** Any use permitted by the underlying zoning regulations may be permitted in the Flood Fringe, provided the use meets the flood protection requirements of Section 4-405, and provided that:

1. New Critical Facilities are prohibited in the Flood Fringe below 6,000 feet (NAVD88) in elevation.
2. Wastewater treatment facilities serving more than two properties are prohibited in the Flood Fringe.
3. Individual OWTS, when allowed, must conform to the requirements of 4-405(G).
4. Fences in the Flood Fringe are subject to all Boulder County Building Code and other fence requirements.

4-404.1 General Floodplain Development Permits

A. **Intent.** To minimize undue hardship to property owners within Boulder County yet remain in compliance with FEMA regulations regarding Floodplain permitting, the County Engineer is authorized to issue one or more General Floodplain Development Permits. The intent of the General FDP is to allow certain limited uses and activities in the ~~Floodplain~~ FO District without the need for an approved Individual FDP because these specific uses and activities are unlikely to increase BFEs or have an adverse effect on neighboring properties, species, or ecosystems.

B. **Review Criteria.** The County Engineer may issue or amend a General FDP so long as the following criteria are met:

1. The uses or activities covered by the General FDP are likely to have little or no effect on the efficiency or capacity of the Floodway;
2. The uses or activities covered by the General FDP are likely to have little or no effect on lands upstream, downstream and in the immediate vicinity of the development covered under the General FDP including, without limitation, utility and transportation facilities;
3. The uses or activities covered by the General FDP will not result in an unreasonable risk of harm to people or property – both onsite and in the surrounding area – from natural hazards;
4. The uses or activities covered by the General FDP are likely to have little or no effect on the flood profile and flood heights;
5. The uses or activities covered by the General FDP are likely to have little or no effect on any tributaries to the main stream, drainage ditches, water supply and irrigation ditches, storm drainage facilities, reservoirs, or any other drainage or irrigation facilities or systems;
6. The uses or activities covered by the General FDP are likely to have little or no effect on the flood management program for the area(s) in question and will not result in the need for additional public expenditures for flood protection or prevention;
7. The uses or activities covered by the General FDP shall not result in new human occupancy of structures;
8. The uses or activities covered by the General FDP are likely to have little or no effect on the safety of access to property in times of flood for ordinary and emergency vehicles;
9. The uses or activities covered by the General FDP are likely to have little or no effect on the watercourse, including streambanks and streamside trees and vegetation;

10. The alignment of the uses or activities covered by the General FDP is consistent with the Boulder County Comprehensive Plan and Watershed Master Plans;
11. The cumulative effect of the uses or activities covered by the General FDP along with other existing and anticipated uses is unlikely to increase flood heights more than the allowances specified in 4-404(A);
12. The heights and velocities of the floodwaters expected in the area where the uses or activities covered by the General FDP will not adversely affect the development of surrounding property;
13. The uses or activities covered by the General FDP are unlikely to require additional flood protection based on historical flood evidence, increased development upstream, or other flood-related hazards such as flash flooding, debris flows, rockfalls, mudslides, landslides, avalanches, channel avulsions, alluvial fan hazards, erosion and deposition of material, debris dams, ice jams, and high flood depths or velocities; and
14. The uses or activities covered by the General FDP are not contrary to federal, state, and local floodplain statutes, regulations, and guidance.

C. **Rescission.** The County Engineer may rescind a General FDP if uses or activities covered by the General FDP no longer meet the criteria for issuance of a General FDP as specified in section 4-404.1(B).

D. Content of a General FDP. If the County Engineer determines it appropriate to issue a General FDP after consideration of the factors in 4-404.1(B) above, he shall include the following information on the face of the permit.

1. A list of specific uses and activities deemed within the scope of the General FDP.
2. Whether or not property owners must notify the County Engineer prior to beginning work on an activity included within the General FDP.
    a. The County Engineer shall require such notification for development activities for which it is necessary to evaluate individual and cumulative impacts, ensure minimum compliance with federal and state floodplain rules, and confirm that the uses or activities are unlikely to increase BFEs or have an adverse effect on neighboring properties, species, or ecosystems.
    b. For projects where the County Engineer will receive notice through referral required by a separate Land Use Code review process (such as Site Plan Review or Special Use Review), the County Engineer need not require duplicative notification. For all other projects where the County Engineer decides to require notification, the applicant must submit the

following information to the County Engineer a minimum of 21 days prior to commencing work:

(i) Project description, including materials description and a discussion on the expected impact to the channel and floodplain;

(ii) Location description (an accompanying location map is best); and

(iii) Site plan, if necessary to further describe the work.

c. If the work is within the scope of the General FDP, the County Engineer will respond to the owner with approval to proceed. If additional information is necessary or if the work requires issuance of an Individual FDP, the County Engineer will inform the owner within 14 days of notification submission, or through the Land Use Review referral process.

3. Conditions of approval, if any, for work approved under the General FDP.

E. **Process for Issuing, Amending, or Rescinding a General FDP.**

1. If the County Engineer determines that a new General FDP is appropriate after consideration of the factors in 4-404.1(B) above, he shall post the proposed General FDP on the Transportation Department website and also in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. No such new FDP shall become effective until 14 days after the date it is posted.

2. If the County Engineer determines that an amendment to an existing General FDP is appropriate after consideration of the factors in 4-404.1(B) above, he shall post the revised General FDP on the Transportation Department website and also in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. No such revised FDP shall become effective until 14 days after the date the revision is posted.

3. If the County Engineer determines that an existing General FDP should be rescinded in its entirety per section 4-404.1(C) above, he shall post a notice to this effect on the Transportation Department website and in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. The General FDP shall be deemed rescinded 14 days after the date the rescission notice was posted.

4. In addition to the notice required above (per Section 3-205), the County Engineer shall maintain a record of all property owners who wish to opt in to receiving direct notice of all proposed actions by the Engineer regarding a General FDP. The Engineer shall send notice (via electronic means to the most recent electronic mail address on file) to all such owners regardless of whether the proposed action

is issuance of a new General FDP, amending an existing General FDP, or rescinding a General FDP; provided, however, that inadvertent failure to notify every such owner shall not affect the validity of any action by the Engineer on a General FDP.

5. If the County Engineer receives public comment on a proposed new, amended, or rescinded General FDP during the 14-day notice period, then prior to the effective date the Engineer shall consider such comments to determine whether in his professional judgment as floodplain administrator any changes to the proposed action are merited.

6. Subject to the notice requirements described above, the County Engineer may issue, amend, or rescind a General FDP at any time, on his own initiative, without the need for public hearings before Planning Commission and Board of County Commissioners.

7. The County Engineer's decision to issue, amend, or rescind a General FDP shall be in writing and shall be a final action appealable pursuant to section 4-408.

8. All General FDPs in effect at a given point in time must comply with all applicable provisions of this section 4-404.1.

F. No Permit Fees. If the County Engineer determines a use or activity falls under the approval granted in a General FDP, no permit fee will be charged ~~to the owner~~.

G. Work Not Approved under a General FDP. Any development within the Floodplain that does not meet the criteria of a General FDP requires either approval of an Individual FDP prior to beginning the work or a determination by the County Engineer that no FDP is required at all.

1. Should any work commence that is assumed by an applicant to be covered by a General FDP, and the County Engineer determines it is not covered by a General FDP, a Stop Work order will be issued. The unpermitted work will be treated as a zoning violation under Article 17 until an approved Individual FDP is issued or the violation is otherwise resolved.

2. Anyone considering a project in the Floodplain that varies from the projects described in an issued General FDP should contact the County Engineer to determine if an Individual FDP application is required. The County Engineer makes the final decision as to the applicability of a General FDP. Any project determined by the County Engineer to create a significant obstruction to flood flows will require an Individual FDP.

H. **Other Permits.** Eligibility for a General FDP does not eliminate the need for applicants to obtain all other required permits, including building, grading, access, construction,

and/or stormwater permits from Boulder County, as well as other state and federal permits.

I. **Records of Issued General FDPs.** A copy of all issued General FDPs, including previous versions, will be kept on file in the County Engineer's office at all times and available for public review.

4-404.2 Individual Floodplain Development Permits

A. **Floodplain Pre-Application Conference**. A Floodplain Pre-Application Conference (Floodplain Pre-App) between the applicant and the County Engineer (or his/her designee) is required for all Individual FDPs, unless waived in writing by the County Engineer as unnecessary under the circumstances. The Boulder County Land Use Department may require a Pre-Application Conference as defined in Section 3-201, which may be substituted for the Floodplain Pre-App requirement of this section. The Floodplain Pre-App should include discussion of conforming and nonconforming structures and uses on the subject property.

B. **Submittal Requirements.** Applications for Individual FDPs are to be submitted to the Boulder County Land Use Department and are subject to the following submittal requirements, unless the County Engineer determines that a particular requirement does not apply.

1. For all Individual FDP submittals:

   a. A completed Individual FDP application form;

   b. A narrative describing the work to be performed; and

   c. A location map, showing the specific areas and property(ies) where the work will be performed.

   ~~c.~~d. Adequate evidence of either direct ownership of the subject property or legal authority to act on behalf of the owner(s) of record.

2. For Projects in the Floodway, an engineering analysis certified by a P.E. registered in the State of Colorado in accordance with 4-404.2(E).

~~2.~~3. For construction of new buildings or improvements to existing buildings, t~~T~~he County Engineer will obtain pertinent documents from the applicant's Building Permit submittal package. Building Permit/Individual FDP submittals should include and call out all elements for flood protection required per 4-405. In addition, the following items shall be included in the Building Permit/Individual FDP submittal:

a. Specifications for construction and building materials (including considerations for flood resistant materials when required, per FEMA *Technical Bulletin 2*);

b. Description and locations of any proposed site, filling, dredging, grading, and/or channel improvements

c. Location of any and all proposed materials storage and staging areas, as applicable;

d. Location of the current regulatory FO District boundaries, including both FEMA and/or Boulder County Floodplain information;

e. Plans must include the elevation, in feet referenced to the North American Vertical Datum of 1988, to which the flood protection measures apply. See 4-405(A), Flood Protection Elevation.

f. Certification that the building or improvement is designed in accordance with the flood protection measures outlined in 4-405(C) for New Floodplain Construction and conforming existing buildings and 4-413 for improvements to nonconforming existing buildings.

g. For all new building proposals where a Floodway has not been mapped, a Floodway analysis, consistent with 4-404.2(E);

~~f.~~h. For all new subdivision proposals and other developments (including, but not limited to, manufactured home parks) greater than either 50 lots or 5 acres that are located in Zone A, a hydraulic analysis that conforms to the requirements of 4-404.2(E). This analysis must also depict the BFEs that Boulder County will use to determine FPEs for the proposed development.

~~3.~~4. For bridges, culverts, other hydraulic structures, work within the channel banks, and stream restoration projects, in addition to the items listed above, the following items are required:

a. A plan at a scale of 1" = 200' or larger, stamped by a P.E. registered in the State of Colorado, which includes:

i. the site location;

ii. existing and proposed base flood limits and water surface elevations, if applicable;

iii. Floodway limits, if applicable;

iv. channel, watercourse or flowpath;

v. vertical and horizontal datum;

vi. existing and proposed contours or elevations at 2' intervals;

vii. existing buildings

viii. location and elevations of existing streets, water supply, and sanitation facilities, if applicable;

ix. limits and total land area of all existing and proposed impervious surfaces, including buildings; and

x. existing water supply ditches, irrigation ditches and laterals.

b. A typical valley cross-section showing:

i. channel, watercourse, or flowpath;

ii. limits of floodplain adjoining each side of channel;

iii. cross-section area to be occupied by the proposed development;

iv. existing and proposed base flood water surface elevations;

c. Documentation ,including hydraulic modeling, that addresses scour (if required) and other design requirements in accordance with t~~T~~he Boulder County Storm Drainage Criteria Manual

d. Evidence of compliance with 4-404.2(D) of this section.

e. Evidence of compliance with Section 404 of the Clean Water Act and the Endangered Species Act.

~~4.~~5. For OWTS, a Site Plan that includes items 4-404.2(B)(~~3~~4)(a)(i-viii) above is required, in addition to the following:

a. A geotechnical report, certified by a P.E. registered in the State of Colorado, which includes specifications on the system type and layout, building connections, and the flood protection measures required under 4-405(G).

~~5.~~ 6. For underground utilities not covered by the General FDP, an analysis of the impacts of scour potential as well as design considerations to protect against scour must be provided.

~~6. For Projects determined to be in the Floodway as defined in 4-414, an engineering analysis certified by a Colorado-registered P.E. in accordance with 4-404.2(E).~~

7. For any proposed Alteration or relocation of a watercourse, including stream restoration projects and engineered channelization projects, the County Engineer requires a description of the extent to which any watercourse will be altered or

relocated, and that conveyance is not decreased as a result of the project, and that the flood carrying capacity of the watercourse is maintained over time.

a. All proposals for watercourse Alteration or relocation must include, in addition to all other applicable materials, pre- and post-project conveyance calculations to demonstrate that the flood carrying capacity has not been decreased.

b. For engineered channelization projects, including those types outlined in the Boulder County Storm Drainage Criteria Manual, permit applicants are required to submit, along with all other applicable materials, a maintenance plan that outlines the maintenance activities to be performed, the timing/schedule for those activities, and the agency or representative responsible for maintenance in order to ensure the flood carrying capacity is maintained.

c. Prior to any Alteration or relocation of a watercourse, the County Engineer must notify adjacent communities, potentially affected property owners, and the CWCB in the following manner:

i. Notification must be done through the publication of a notice of such proposed alteration or relocation once in a newspaper of general circulation in Boulder County.

ii. The County Engineer must keep on-file evidence of such notification.

d. Watercourse Alteration/relocation/channelization projects in the FO District are subject to the county's modeling requirements covered in 4-404.2(E) prior to permitting. In addition, at the discretion of the County Engineer, any watercourse alteration/relocation/channelization project that shifts the stream horizontally in any direction more than one bankfull width will require submittal and approval of a CLOMR from FEMA prior to permitting.

~~8. Adequate evidence of either direct ownership of the subject property or legal authority to act on behalf of the owner(s) of record;~~

~~9.~~8. Any additional information required by the County Engineer necessary to allow the review criteria in this Article 4-400 to be adequately evaluated.

C. **Completeness Review by the County Engineer.** Once an application for an FDP is filed, the County Engineer must review it for completeness.

1. The County Engineer may suspend processing an FDP application at any time at the request of the applicant or whenever the County Engineer determines that the application is not complete. The County Engineer may deem the application

incomplete, based on the application submittal requirements, at the County Engineer's initiative or at the request of a referral agency. In the event that the County Engineer deems an application incomplete, the County Engineer will immediately notify the applicant of the shortcomings. Once the requested information has been provided, the application must be deemed filed as of that date and the County Engineer will proceed to process the application and render a decision. If an application is not deemed complete within six months of the date of suspension, the County Engineer may declare the application withdrawn. The six month time frame may be extended should the County Engineer determine that circumstances beyond the control of the applicant prevent a timely completion of the application.

D. **Application Review Criteria.** In reviewing an application for a Floodplain Development Permit, the County Engineer must first determine the specific flood hazard at the site in accordance with 4-403 and evaluate the suitability of the proposed use or development in relation to the flood hazard. The County Engineer must then consider the following factors in reviewing Individual FDP applications:

1. the effect of the proposal upon the efficiency or capacity of the Floodway;
2. the effect on lands upstream, downstream and in the immediate vicinity of the development including, without limitation, utility and transportation facilities;
3. the probability that the proposal will result in unreasonable risk of harm to people or property – both onsite and in the surrounding area – from natural hazards;
4. the effect of the proposal on the flood profile and flood heights;
5. the effect of the proposal on any tributaries to the main stream, drainage ditches, water supply and irrigation ditches, storm drainage facilities, reservoirs, or any other drainage or irrigation facilities or systems;
6. the relationship of the proposed development to the flood management program for the area in question, including whether additional public expenditures for flood protection or prevention will be necessary;
7. whether the applicant would obtain an undue advantage compared to later applicants who might request a permit;
8. whether the proposed use is for human occupancy;
9. the susceptibility of the proposed facility and its contents to flood damage;
10. the safety of access to the property in times of flood for ordinary and emergency vehicles;
11. whether any proposed changes in a watercourse will have an environmental effect on the watercourse, including streambanks and streamside trees and vegetation;

12. the alignment of the proposed development with the Boulder County Comprehensive Plan, Watershed Master Plans, and any other planning-related documents pertaining to development in Boulder County;

13. whether the cumulative effect of the proposed development with other existing and anticipated uses will increase flood heights more than the allowances specified in 4-404(A);

14. whether the heights and velocities of the floodwaters expected at the site will adversely affect the development of surrounding property; and

15. whether additional flood protection is necessary based on historical flood evidence, increased development upstream, or other flood-related hazards such as flash flooding, debris flows, rockfalls, mudslides, landslides, avalanches, channel avulsions, alluvial fan hazards, erosion and deposition of material, debris dams, ice jams, and high flood depths or velocities.

E. Procedures for Modeling Propos~~s~~ed Development within the ~~Floodway~~FO District.

1. Unless one or more requirements below are modified by the County Engineer for good cause shown by the applicant, for ~~all~~ any project~~s~~ in the FO District that requires hydraulic modeling (including those projects confirmed to be wholly or partially within the Floodway) the applicant must submit an engineering report~~,~~ (including a Floodplain and Floodway analysis, as applicable) certified by a P.E. registered in the State of Colorado ~~qualified engineer licensed in Colorado~~ using the same type of model that was used to establish the current regulatory flood hazards. Applicants may obtain a copy of the applicable floodplain model from Boulder County. Models that differ from the type used to establish the regulatory flood hazards must first be approved for use by the County Engineer.

2. Modeling submitted to Boulder County in support of an Individual FDP must include the following:

   a. Duplicate Effective (Regulatory) Model. This model is necessary to confirm that the regulatory water surface elevations can be reproduced to within 0.5 foot. When Boulder County regulates flood hazards that are more conservative than those identified by FEMA, it is the model that is associated with the Boulder County Floodplain.

   b. Corrected Effective Model. The model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections, updates the 100-year flood discharges, or incorporates more detailed topographic information than that used in the current effective model. Floodway limits should be manually set at the new cross-section locations ~~by measuring from the effective FIRM~~. The cumulative reach lengths of the stream should also remain unchanged. The Corrected Effective model

must not reflect any man-made physical changes since the date of the effective model.

c. Existing or Pre-Project Conditions Model. The applicant must revise the duplicate effective or corrected effective model to reflect any modifications (including man-made encroachments) that have occurred within the floodplain since the date of the effective model but prior to construction of the proposed project. If no modifications have occurred since the date of the effective model, then the model would be identical to the duplicate effective or corrected effective model, and only one of these models is required. The results of this existing conditions analysis will indicate the 100-year elevations to be used for comparison to proposed conditions at the project site.

d. Proposed or Post-Project Conditions Model. The applicant must then modify the existing conditions model (or duplicate effective, or corrected effective, as appropriate) to reflect the proposed project. The overbank roughness coefficients should remain the same unless a reasonable explanation of how the proposed project will impact roughness values is provided, with supporting data. The results of this analysis will indicate the 100-year elevation for proposed or post-project conditions at the project site. ~~These results must demonstrate no impact (measured as 0.00) to the 100-year water surface elevations when compared to the existing conditions model (referred to as a "No-Rise Certification").~~

3. For Floodway modeling, the following surcharge criteria apply:

   a. In the plains areas and below 6,000 feet in elevation, both FEMA and Boulder County follow the Colorado statewide standard for Floodway calculation, which employs a six-inch (0.50 foot) model surcharge for all reaches studied by detailed methods (Zone AE) after January 14, 2011 (see Colorado DNR- CWCB Rules and Regulations for Regulatory Floodplains in Colorado, dated November 17, 2010).

   b. In the foothill canyons and mountain areas above 6,000 feet in elevation, as a result of steep channel slopes, high flow velocities, and erosive forces, and to reserve areas of active flow such that those areas are free of development and other encroachments, a 0.00-foot surcharge shall be applied to all reaches studied by detailed and approximate methods (Zone AE and Zone A).

4. Results of the Existing Conditions Model must be compared to the results of the Proposed Conditions Model, and must demonstrate compliance with the following:

a. Under the provisions of 44 C.F.R. Chapter 1, § 65.12, of the NFIP Regulations, a community may permit encroachments within the adopted FEMA regulatory Floodway that would result in an increase in BFEs (greater than 0.00) if the applicant first receives an approved CLOMR and/or Floodway revision from FEMA prior to permitting.

b. In FEMA floodplain areas where no FEMA Floodway exists:

(i) If Boulder County has designated a locally-regulated Floodway, any encroachment that results in water surface elevation increases between 0.0 and 0.5 foot in these areas must first receive an approved Boulder County floodway review (County Engineer review of proposed projects to ensure project impacts are minimized), and increases greater than 0.5 foot must first receive an approved CLOMR from FEMA prior to permitting.

(ii) If Boulder County has not designated a locally-regulated Floodway, then increases in water surface elevation up to 0.50 foot may be permitted before an approved CLOMR from FEMA is required without a Boulder County floodway review.

c. In Boulder County floodplain areas where no FEMA floodplain exists, encroachments resulting in water surface elevation increases up to 0.50 foot may be permitted, and those greater than 0.50 foot must receive an approved Boulder County floodway review from the County Engineer.

d. Any increase in water surface elevations that are a direct result of a man-made development project and that impact an insurable building will not be allowed.

5. Following project completion, the County Engineer may direct applicants to provide FEMA with all information required by 44 C.F.R. Part 65 relating to water surface elevation changes (and in accordance with 4-403(D)(5)) so that FEMA may determine whether a map revision is appropriate.

~~(i) Should this comparison result in water surface elevation increases that cannot be mitigated through project design changes, then the provisions of 4-404(C)(2)(a) must apply.~~

~~e. All models must use the most current regulatory hydrology.~~

4-405 Flood Protection Measures

Flood Protection Measures apply to development within the FO District in Zones AE, A, AO, and AH.

A. **Flood Protection Elevation ("FPE").** For the purposes of this section, the Boulder County FPE is equal to the following:

1. In areas depicted as Zone AE and AH in the FO District, the FPE is equal to the BFE plus 2 feet. The BFE is the elevation of the 1%-annual-chance (typically referred to as 100-year) flood. In other words, it is the flood that has a 1% chance of occurring in any given year.
2. In areas depicted as Zone A in the FO District, the following applies:
    a. As required by 44 C.F.R. § 60.3(b)(4), Boulder County must obtain and reasonably utilize BFE and water surface elevation information from local, state, federal, or other reliable sources
    b. In those Zone A areas where a BFE can be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 2 feet above the calculated BFE
    c. In those Zone A areas where a BFE cannot be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 3 feet above the highest grade in the area of the proposed development.
        (i) For buildings, the FPE will be 3 feet above the highest grade within the proposed building footprint, or the highest grade adjacent to the exterior of the existing building, unless the applicant supplies information sufficient to determine a BFE and subsequent FPE for the building~~, including data submitted as a part of identifying the Floodway boundary pursuant to the Floodway definition in 4-414~~.
3. In shallow flooding areas (Zone AO), the FPE is equal to:
    a. Two feet above the specified flood depth; or
    b. If no flood depth is specified, 3 feet above the highest grade that exists within the proposed building footprint.

B. General Requirements

1. All development in the FO District must be adequately protected from flooding according to the requirements of this section.
2. Prior to submitting an application, applicants shall confirm with the County Engineer all conforming and nonconforming structures and uses on the subject

property. Improvements to conforming structures and buildings must meet all applicable requirements in section 4-405. Improvements to nonconforming structures and buildings must meet all applicable requirements in section 4-413.

3. Materials that are buoyant, flammable, hazardous, toxic, or explosive, or that in times of flooding could be harmful to human, animal, or plant life, may not be stored or processed except at or above the FPE, unless the materials are stored in accordance with 4-405(H) governing storage tanks.
4. All construction (including New Floodplain Construction as well as improvements below the FPE) must be built with materials and utility equipment resistant to flood damage up to the FPE.
5. All new and replacement water supply systems must be designed to minimize or eliminate infiltration of flood waters into the system.
6. Lateral additions to any residential building must be elevated to the FPE and adequately anchored to prevent flotation, collapse, or lateral movement of the addition resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
7. Lateral additions to any commercial or accessory building or structure must be adequately protected from flooding in accordance with 4-405(C)(3)(a) and 4-405(C)(3)(b), respectively.

C. New Floodplain Construction

1. General Requirements

    a. All New Floodplain Construction must be built using methods and practices that minimize flood damage.

    b. New Floodplain Construction in the Floodway is prohibited.

    c. New Basements in the Flood Fringe are prohibited.

    d. All New Floodplain Construction must be designed and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, and must be certified by a P.E. registered in the State of Colorado that they have been constructed to withstand such forces and are adequately protected from flooding up to the FPE;

    e. New buildings or other structures must be placed with their longitudinal axes parallel to the predicted direction of flow of flood waters or be placed so that their longitudinal axes are on lines, parallel to those of adjoining structures, to the extent consistent with other provisions of this

code. This is intended to minimize the obstruction to flow caused by a building or structure.

f. New service equipment, including, but not limited to, electrical, heating, ventilation, plumbing, and air conditioning equipment, must be located at or above the FPE.

g. New Floodplain Construction in Zone AO or AH must be accompanied by site/property grading to accommodate drainage of floodwaters around the perimeter of the building in a controlled manner, without adversely impacting adjacent properties.

h. New Floodplain Construction on a property removed from the floodplain by issuance of a LOMR-F from FEMA must have the Lowest Floor elevated to or above the FPE that existed prior to the placement of fill.

2. Residential Buildings

a. All new residential buildings constructed in the Flood Fringe or within Zones A, AO, or AH must have their Lowest Floors (including Basements, porches, and decks), as well as any and all service equipment (excepting the necessary connections to public utility), elevated to the FPE, either by the placement of fill or by construction on elevated foundation walls.

b. Fully enclosed areas below the lowest floor of a building in the FO District must be used solely for parking of vehicles, building access, or storage of materials. These areas must be designed to equalize the hydrostatic pressure flood forces on exterior walls by allowing for the entry and exit of floodwaters (known as "Wet Floodproofing"). Designs for meeting this requirement must either be certified by a registered Professional Engineer or must meet or exceed the following minimum criteria:

(i) A minimum of two openings on at least 2 walls having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding must be provided;

(ii) The bottom of all openings must be no higher than one foot above grade; and

(iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

c. Attached garages may be constructed at-grade but must comply with 4-405(C)(2)(b) above. Openings are permitted to be installed in garage

doors; however, the garage door itself does not qualify as an opening for Wet Floodproofing purposes.

3. Non-residential Buildings. Non-residential buildings built in the Flood Fringe, or within Zones A, AO, or AH must conform with 4-405(C)(2) above, or must conform with the requirements below based on building type:

    a. Commercial Buildings

        (i) Commercial buildings, including attendant and sanitary facilities and attached garages, must conform with 4-405(C)(2), or must be designed to be water-tight with walls substantially impermeable to the passage of water below the FPE.

        (ii) The building must be anchored to prevent flotation, collapse, or lateral movement.

        (iii) The building must be constructed using structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

        (iv) All flood protection measures for commercial buildings must be certified by a Colorado Registered Professional Engineer that the methods are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces, and other factors associated with the Base Flood. Such certification must also state the specific elevation (including vertical datum reference) to which the construction is protected from flooding.

        (v) For commercial buildings designed to be watertight, the FEMA Floodproofing Certificate for Non-Residential buildings should be completed, and must be reviewed and approved by the County Engineer.

    b. Accessory Buildings and structures

        (i) Accessory buildings and structures, including but not limited to detached garages, sheds, barns, and any other structure considered accessory to the primary use or primary building, must conform with 4-405(C)(2) above, or may be constructed at grade but must meet the requirements of 4-405(C)(2)(b) above for fully-enclosed areas below the FPE, and are subject to the following conditions:

            a. The building or structure must be used only for the parking of vehicles or storage of tools, materials, and equipment;

b. The building or structure must not be designed for or used as Habitable Space;

c. The accessory building or structure must represent a maximum investment of less than 10% of the value of the principal building on the property, or a maximum floor area of 600 square feet;

d. The building or structure must have low flood damage potential with respect to both the building and its contents; and

e. Permanently affixed appliances (such as furnaces, heaters, washers, dryers, etc.) are prohibited.

f. Prior to issuance of Certificate of Occupancy or final inspection, whichever occurs last, the property owner must execute a Non-Conversion Agreement and the County must record the agreement in the real estate records. The agreement will be in the form of a restrictive covenant or other County approved binding instrument, where the benefits of the covenant run in favor of the County. The covenant must be drafted to run with the land and bind successors, in perpetuity. The purpose of the covenant is to document the current owner's understanding of the limitations on construction and use of the enclosed area in accordance with the provisions of this section 4-405(C)(3)(b) (Accessory Buildings and Structures), and to put prospective purchasers on notice of such restrictions. The covenant will also reference retrofitting criteria necessary to properly convert accessory buildings or structures to habitable space, should the owner choose to do so. In addition to any other enforcement mechanisms available, violation of the agreement will be considered a violation of this Article 4-400 and subject to all applicable zoning enforcement procedures.

(ii) Accessory structures that do not have at least two rigid walls, including but not limited to carports, gazebos, and picnic pavilions, may be constructed at grade and must use flood-resistant materials up to the FPE.

(iii) Accessory Dwelling Units (including detached garages designed with Habitable Space on the second floor) must meet the above

requirements of 4-405(C)(2) for residential buildings , which includes either elevation of the entire building above the FPE, or wet floodproofing of the lower level garage space.

c. Agricultural Buildings and Structures. New Floodplain Construction of any Permanent agricultural building or structure in the Flood Fringe must be limited in use to agricultural purposes, in which the use is exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock. Types of buildings and structures that qualify under this section include farm storage structures (used exclusively for the storage of farm machinery and equipment), grain bins, corn cribs, and general purpose barns/loafing sheds.

(i) The building or structure must not be designed for or used as Habitable Space.

(ii) The building or structure must be wet-floodproofed according to 4-405(C)(2)(b).

(iii) Service equipment must be elevated to the FPE, unless elevation of such equipment impedes its agricultural use.

(iv) Permanent agricultural buildings or structures are prohibited in the Floodway.

(v) Temporary agricultural buildings or structures are allowed in the floodway, but are required to be relocated outside of the FO District or deconstructed in the event of a flood warning. If relocation outside of the FO District is not possible, then relocation to the Flood Fringe will be allowed, so long as the temporary structure is properly anchored.

d. Crawlspaces. New Floodplain Construction of any Below-Grade Crawlspace must:

(i) Have the interior grade elevation, that is below BFE, no lower than two feet below the Lowest Adjacent Grade;

(ii) Have the height of the Below-Grade Crawlspace measured from the interior grade of the Crawlspace to the top of the foundation wall, not to exceed four feet at any point;

(iii) Have an adequate drainage system that allows floodwaters to drain from the interior area of the Crawlspace following a flood; and

(iv) Meet the provisions 4-405(C)(1), General Requirements.

D. Critical Facilities

1. New Critical Facilities are prohibited in the regulatory floodplain below 6,000 feet (NAVD88) in elevation.
2. In the mountain canyons above 6,000 feet (NAVD88), new Critical Facilities in the FO District will be considered on a case-by-case basis, and may require special design or flood protection considerations, including considerations of hydrodynamic flood forces and flood-induced erosion.
3. Improvements to existing Critical Facilities that are determined to be Substantial Improvements require that the entire facility (including attendant utility and sanitary facilities) be elevated to the Boulder County FPE or, if not prohibited elsewhere in this code, be retrofitted such that the building is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads, including the effects of buoyancy.

E. Manufactured Home Parks

1. General Requirements. All manufactured homes must be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated to the FPE and anchored to resist floatation, collapse, or lateral movement. All requirements below are in addition to applicable state and local requirements, including those to address wind loads.
2. For new parks commenced on or after February 1, 1979; expansions to existing parks; existing parks where the value of the repair, reconstruction, or improvement of the streets, utilities, and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement has commenced; an existing park on which a manufactured home has incurred Substantial Damage; manufactured homes to be placed or substantially improved on sites in existing parks; and for manufactured homes not placed in a park:

    a. Stands or lots must be elevated on compacted fill or on pilings so that the lowest floor of the manufactured home will be at or above the FPE. For homes placed on pilings:

        (i) lots must be large enough to permit steps;

(ii) piling foundations must be placed in a stable soil no more than ten feet apart; and

(iii) reinforcements must be provided for pilings more than six feet above the ground level.

b. Adequate surface drainage must be provided.

c. New manufactured homes must be anchored by providing over-the-top and frame ties to ground anchors as well as the following:

(i) over-the-top ties at each of the four corners, with two additional ties per side at intermediate locations, with the exception of manufactured homes less than 50 feet long which require only one additional tie per side;

(ii) frame ties at each corner with five additional ties per side at intermediate points, with the exception of manufactured homes less than 50 feet long which require only four additional ties per side;

(iii) all components of a manufactured home anchoring system must be capable of carrying a force of 4800 pounds; and

(iv) Any additions to the manufactured home be similarly anchored.

F. Recreational Vehicles

1. At least one of the following provisions must be met:

a. The recreational vehicle must be on the site for fewer than 90 consecutive days;

b. The recreational vehicle must be fully licensed and ready for highway use; or

c. The recreational vehicle must meet the permit requirements and elevation and anchoring requirements for manufactured homes, in accordance with Section 4-405(E) of this section.

G. Onsite Wastewater Treatment Systems

1. For the purposes of this section, "New OWTS" is the first OWTS installed on a parcel.

2. The location of new and replacement OWTS must be done in such a manner as to avoid impairment to or contamination from the systems during flooding.

a. Placement of a new OWTS in the F~~O District~~ loodway ~~(including both Floodway and Flood Fringe areas)~~ is prohibited. Placement of a new

OWTS in the Flood Fringe or other Zone AE, A, AO, or AH areas is also prohibited~~,~~ ~~-~~unless the County Engineer determines that placement in the Flood Fringe cannot be avoided, in which case priority must be given to those locations on the subject property where flood depths and/or velocities are the lowest, and to the optimal location of the water supply.

3. New OWTS

a. All Tanks, including Septic Tanks, for new OWTS in the FO District must be made of concrete.

b. Tanks must be adequately anchored to protect against buoyant forces associated with flooding and high groundwater, which is typical during flood conditions.

(i) Tanks that are installed within the Boulder County or FEMA 500-year floodplain should be anchored to protect against uplift from high groundwater. ~~Where the 500-year floodplain is not shown, the anchoring requirement will apply if the lowest elevation of the tank is at or below the 100-year base flood elevation adjacent to the tank location.~~

(ii) Boulder County requires that the FEMA-recommended calculation for determining buoyant forces (contained in FEMA P-348, or the latest FEMA guidance document covering building utilities) be used to adequately design buoyancy countermeasures. The equation is as follows:

$$F_b = 0.134 V_t \gamma FS$$

Where:	F_b	is the buoyancy force exerted on the tank, in pounds.
	V_t	is the volume of the tank in gallons.
	0.134	is a factor to convert gallons to cubic feet.
	γ	is the specific weight of flood water surrounding the tank (generally 62.4 lb/ft^3 for fresh water and 64.1 lb/ft^3 for salt water.)
	FS	is a factor of safety to be applied to the computation, typically 1.3 for tanks.

c. Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of septic effluent.

d. Raised Soil Treatment Areas are required,~~.~~ and must be designed such that the base of the distribution layer is a minimum of 2 feet above existing grade

e. Connections to the house must be fitted with backflow prevention, unless it is demonstrated in the permit application that the connection pipe rises above the calculated FPE for the site.

f. With the exception of the Soil Treatment Area, earthwork necessary for system installation must not exceed pre-construction grade.

g. While not required, backup generators are recommended for any system fitted with electric pumps or controls.

4. Repair/Replacement OWTS

a. For any OWTS in the Flood Fringe that requires replacement, the system must meet the requirements of 4-405(G)(3).

b. In addition to the requirements of 4-405(G)(4)(a), for any repair or replacement of an existing OWTS in the Floodway the County Engineer must determine that the proposed repair/replacement is consistent with Subsections (i) through (iii), below.

(i) The property owner has demonstrated that connection to a central sewer system is not feasible by:

a. Providing a letter of denial from the closest sewer provider; or

b. Demonstrating other reasons why connection is not feasible, such as that there is no central sewer system reasonably close to the property or building to be served, or that easement restrictions exist that effectively prohibit connection. For properties within a Community Service Area, connection will be deemed not feasible if the cost of connection exceeds 25% of the most recent assessed value of the subject property.

(ii) The proposed repair or replacement design must be protective of groundwater and appropriate for a Floodway. In making a proposal to the County Engineer, the applicant must address the following factors, among other pertinent information:

a. Whether it is practical to remove outbuildings or non-conforming additions to allow for increased soil

availability so that the proposed repair or replacement can be located outside of the Floodway;

b. Whether there is room for an at- or below-grade recirculating sand filter, or similar treatment media, and the required absorption area;

c. Whether placement in the hydraulic shadow of a legal, existing structure is possible.

(iii) In no event must a proposed repair or replacement increase the overall capacity of the existing OWTS, unless the expansion is necessary to meet the Boulder County OWTS Regulations, as administered by the Boulder County Public Health Department. In addition, the County Engineer may approve a raised absorption system or installation of a vault only as a last option within the Floodway and provided that this option meets the provisions of Article 4-413 (Nonconforming Uses).

H. Liquid Propane Gas (LPG) or Other Similar Storage Tanks

1. Placement of a new or replacement LPG or other similar storage tanks in the FO District is prohibited, unless the County Engineer determines that placement in the FO District cannot be avoided, in which case location decisions must prioritize those portions of the subject property where flood depths and/or velocities are the lowest, including, but not limited to the conveyance shadows of existing buildings.

2. When allowed, above-ground tanks must be placed on a concrete pad that extends to or above the FPE and is sufficiently-anchored. If elevation of the tank conflicts with IBC requirements, the IBC requirements must prevail; however, in all cases, sufficient protection must be provided to the tank such that it resists the expected hydrostatic and hydrodynamic flood forces.

3. When allowed, underground tanks must be designed and installed to resist the effects of buoyancy during high groundwater or flooding conditions. Buoyancy calculations must assume an empty tank and must use the same calculation outlined for Septic Tanks in 4-405(G)(3) above. Anchoring of the tank is required if the empty tank alone will not counteract the calculated buoyant force.

4. All connections and components related to the tank or fuel system must be designed such that floodwaters cannot infiltrate or accumulate within any component of the system.

    a. Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of tank contents, or must extend above the FPE.

b. Tanks located inside of a building must also meet all of the requirements of this section.

I. Historic Buildings and Structures Exempt. The repair or rehabilitation of buildings or other structures designated as historic through either the Boulder County Historic Landmark process or through a State of Colorado or national historical registry process is exempt from Flood Protection Requirements under Section 4-405. Entitlement to such an exemption requires the applicant to show:

1. Documentation that the building or structure is designated as a historic building or structure as defined by Article 18-203(A); and
2. Documentation that confirms that the proposed work will not preclude the structure's continued historic designation.

J. Elevation Certificate Requirements

1. As built Lowest Floor Elevations (referenced to the NAVD88 datum) for all New Floodplain Construction, Substantial Improvements, other improvements, or for new manufactured home stands, must be certified by a Colorado Registered Professional Engineer or Colorado Registered Professional Land Surveyor. Elevation Certificates must be submitted to the Building Division Inspector and County Engineer twice over the duration of the project. Failure to submit an Elevation Certificate will result in a Stop Work Order until proper certification is provided. To ensure compliance with flood protection requirements during and after construction, completed Elevation Certificates must be submitted at the following times:
    a. For slab-on-grade foundations, a FEMA Elevation Certificate must be submitted prior to final pour of foundation when foundation forms are completed.
    b. For buildings on elevated foundations, such as extended foundation walls, stem walls, or piles, a FEMA Elevation Certificate must be submitted prior to rough framing when the foundation is completed.
    c. For all buildings that have achieved finished construction, a final FEMA Elevation Certificate must be submitted prior to the issuance of Certificate of Occupancy or final inspection.

2. To convert another elevation reference datum to NAVD88, applicants are directed to datum conversion factors within the current effective FEMA FIS report for Boulder County, or to an online datum conversion program. Assumptions used for the datum conversion must be explicitly described to Boulder County on the Elevation Certificate. For datum requirements for permit submittals, see 4-404.2(B).

4-406 County Engineer's Determination

A. If the County Engineer finds in reviewing an Individual FDP application that the application meets the applicable standards set forth in Article 4-400, the County Engineer must approve the permit.

B. If the County Engineer finds that the application can only meet all applicable standards if the FDP approval is conditioned, then the County Engineer must include all necessary and reasonable conditions when issuing the permit. Such conditions may include, but are not limited to, periods of operation, operational controls, sureties, deed restriction, and adequate flood protection. The County Engineer must specify when the conditions must be met.

C. If the County Engineer finds that the application does not meet one or more applicable standards and that a reasonable basis for mitigation measures has not been demonstrated, the County Engineer must deny the application as proposed. The County Engineer's determination must specify the reasons for the denial based upon the FDP review criteria in Section 4-404.2(D).

D. Any determination by the County Engineer to approve, conditionally approve, or deny a FDP must be in writing and mailed or otherwise provided to the applicant.

E. For purposes of appeal to the Board of Adjustment, the County Engineer's determination will be deemed final as of the date the FDP is issued. The applicant may begin work under an issued permit as of the date the permit is issued. If an applicant begins work during the 30-day appeal period to Board of Adjustment, the applicant does so at their own risk, as some or all of the work may need to be modified or removed at the applicant's expense if the Board of Adjustment overturns the County Engineer's decision to issue the permit.

4-407 Review of Permits Approved in Floodway

A. In the event that the County Engineer determines that an Individual FDP application for any development in the Floodway meets the applicable standards for approval, within five business days of permit issuance the County Engineer must publish a notice of the proposed use and the permit issuance on the Boulder County website and transmit a copy of the notice to property owners adjacent to the subject property as well as a description of the process for appealing the decision to the Board of Adjustment.

B. The County Engineer may waive or modify any requirement in 4-407(A) for the following Floodway development:

1. Emergency activities required for the immediate protection of life, safety, or property, or to restore essential public services,

2. Minor disaster recovery repair work that does not cause a rise in predicted 100-year water surface elevation as determined by a qualified engineer licensed in Colorado, and
3. Any development activities that take place entirely inside an existing building.

4-408 Appeal of County Engineer Determination

A. **Right to Appeal.** Any person aggrieved by a final written decision of the County Engineer based upon or made in the course of the administration or enforcement of the provisions of this Article 4-400 may appeal to the Board of Adjustment.

B. **Appeal Application.** The procedures and requirements for filing an appeal may be found in Article 3 and in particular section 3-202(A)(1).

C. **Public Hearing.** Upon receipt of a complete appeal application, the Board of Adjustment must hold a public hearing on the appeal application following the procedures specified in section 3-205(A).

D. **Review Criteria.** In deciding upon an appeal of a County Engineer administrative decision or interpretation made under this Article 4-400, the Board of Adjustment must consider the factors specified in Section 4-1200(A)(1) as well as the additional factors listed below:

1. the technical meaning of the provision being appealed;
2. evidence as to the past interpretation of the provision;
3. the principles of interpretation and rules of construction in Article 1 of this Code;
4. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;
5. the danger that materials may be swept onto other lands to the injury of others;
6. the danger to life and property due to flooding or erosion damage;
7. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
8. the importance of the services provided by the proposed facility to the community;
9. the necessity to the use or structure of a waterfront location, where applicable;
10. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;

11. the compatibility of the proposed use or structure with the existing and anticipated development;
12. the safety of access to the property in times of flood for ordinary and emergency vehicles;
13. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;
14. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and
15. the purposes of this Article 4-400.

E. **Decision of the Board.** The Board of Adjustment must make a record of its decision on the appeal in the same manner as other BOA appeals filed under Article 4-1200. The County Engineer must maintain records of the outcome of all appeals filed.

F. **Effect of Decision.**

1. In no instance can a decision on an appeal to the Board of Adjustment result in a modification to the DFIRM. In order to modify the regulatory boundaries established by FEMA, interested parties must use FEMA's LOMC process or consult FEMA on other options for modification.
2. In no instance can a decision on an appeal to the Board of Adjustment result in a modification to the lateral extent of the Boulder County Floodplain. In order to modify the regulatory boundaries established by the County, the owner must request a rezoning map amendment under the procedures of 4-1100.

4-409 Variances

A. **Right to Request Variance.** Any person may request the Board of Adjustment grant a variance from the requirements in this Article 4-400 subject to the terms and conditions in this section 4-409.

B. **Variance Application.** The procedures and requirements for filing a request for a variance may be found in Article 3 and in particular section 3-202(A)(19).

C. **Public Hearing.** Upon receipt of a complete variance application, the Board of Adjustment must hold a public hearing on the request following the procedures specified in section 3-205(A).

D. **Limitation on Board's Authority.**

1. In deciding upon a variance request made under this Article 4-400, the Board of Adjustment must comply with the limitations on its authority specified in section 4-1202(B)(1).
2. Variances may be issued for New Floodplain Construction of and Substantial Improvements to residential buildings on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing buildings constructed below the FPE, but only if the criteria in section 4-409(E) below are met and subject to the following:
    a. Such a variance may not be issued within any designated Floodway.
    b. Any applicant to whom such a variance is granted must be given written notice that the building will be permitted to be built with a Lowest Floor Elevation below the FPE and that the cost of flood insurance will be commensurate with the increased risk associated with the reduced Lowest Floor Elevation.

E. **Review Criteria.**

1. To grant a variance of a requirement imposed under this Article 4-400, the Board must find that all of the following criteria have been satisfied:
    a. the strict application of this Code would create an exceptional or undue hardship upon the property owner;
    b. the hardship is not self-imposed;
    c. the variance, if granted, will not adversely affect the use of adjacent property as permitted under this Code;
    d. the variance, if granted, will not change the character of the underlying zoning district in which the property is located, and is in keeping with the intent of this Code and the Boulder County Comprehensive Plan;
    e. the variance, if granted, does not adversely affect the health, safety, and welfare of the citizens of Boulder County and is in accordance with the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development;
    f. the variance is the minimum necessary, considering the flood hazard, to afford relief;
    g. the variance, if granted, will not result in increased flood heights, additional threats to public safety, or extraordinary public expenses; and
    h. the variance, if granted, will not create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.

2. Prior to granting a variance of a requirement imposed under this Article 4-400, the Board must also consider the following factors:

   a. the technical meaning of the provision being appealed;

   b. evidence as to the past interpretation of the provision;

   c. the principles of interpretation and rules of construction in Article 1 of this Code;

   d. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;

   e. the danger that materials may be swept onto other lands to the injury of others;

   f. the danger to life and property due to flooding or erosion damage;

   g. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;

   h. the importance of the services provided by the proposed facility to the community;

   i. the necessity to the use or structure of a waterfront location, where applicable;

   j. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;

   k. the compatibility of the proposed use or structure with the existing and anticipated development;

   l. the safety of access to the property in times of flood for ordinary and emergency vehicles;

   m. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;

   n. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and

   o. the purposes of this Article 4-400.

F. **Decision of the Board.** The Board must approve, conditionally approve, or deny the variance request. The Board may attach such reasonable conditions to the granting of variances as it deems necessary to further the purposes of this Article 4-400. The Board must make a record of its decision on the variance in the same manner as other BOA requests for variances filed under Article 4-1200. The County Engineer must report variances granted on an annual basis to FEMA.

G. **Conflicts with 4-1200.** If a conflict arises between the requirements of this Section and the provisions of Section 4-1200, Board of Adjustment, the requirements of this Section control.

4-410 Final Inspection

All approved Individual FDPs are subject to final inspection by the County Engineer or his designee to verify that all conditions of approval have been satisfied.

4-411 Permit Expiration

An approved Individual FDP expires two years after the date of issuance if the permittee has not commenced construction under the permit.

4-412 Amendments to an Approved Individual FDP

Any proposal to change the nature or extent of work approved under an issued Individual FDP approved under this Article must require a request to the County Engineer to determine whether the proposed change constitutes a Substantial Modification to the approved plan. If the County Engineer determines that the change constitutes a Substantial Modification, no such change must be allowed to proceed until an application to amend the approved Individual FDP is filed with the County Engineer and approval granted in accordance with this Article. Any new application is subject to the Code in effect at the time of complete application. The applicant or its successor may appeal the County Engineer's decision to require an amended Individual FDP to the Board of Adjustment, provided that any such appeal must be in writing and must be filed with the County Engineer no later than 30 days following the date of the County Engineer's decision to require an FDP amendment.

4-413 Nonconforming Structures and Uses in the FO District

A. Principles of Construction. This Section is to be read in conjunction with Section 4-1000 (Nonconforming Structures and Uses). This section does not supersede 4-1000 in its entirety; rather, it establishes additional requirements for nonconforming structures and uses located in the FO District. If a conflict arises between the requirements of this Section 4-413 and the provisions of Section 4-1000, the requirements of this Section 4-413 control.

B. Nonconforming Structures, Generally.

1. Any building or structure within the FO District that was lawfully established before the adoption or amendment of this Article 4-400 but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1002.
2. Owners of existing nonconforming insurable buildings must track major repairs, remodeling, additions, and other improvements to determine when such work would constitute a Substantial Improvement. FEMA's minimum requirements for the tracking of improvements and repairs within the Substantial Improvement/Substantial Damage Desk Reference (FEMA P-758), dated May 2010, as amended, is incorporated herein by this reference. Estimates for repair of damage that include additional improvement costs must apply the pre-damaged market value of the building to the sum of the repair and improvement costs.
3. If an amendment to the Official Map or this Article results in a higher BFE/FPE such that a building becomes nonconforming, the higher BFE/FPE will apply to all subsequent permit applications. All work proposed subsequent to the higher BFE must be evaluated to confirm whether it will be a Substantial Improvement.

C. Nonconforming Structures in the Flood Fringe.

1. A nonconforming building or structure (whether residential or non-residential) in the Flood Fringe may not be expanded, improved, repaired, relocated, restored, or replaced unless the work complies with this section.
2. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe proposes a Substantial Improvement or repair of Substantial Damage, the owner shall complete the following steps in the following order:

    a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.

(i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.

(ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

(iii) Relocation to less hazardous locations is strongly encouraged, but not required.

(iv) If a nonconforming building or structure is relocated to a less hazardous location, the retrofitting requirements below may be reduced or eliminated at the discretion of the County Engineer.

b. Retrofitting Existing Buildings.

(i) The entire building or structure must be brought into compliance with the flood protection measures described in section 4-405.

(ii) All Flood Fringe retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).

3. Work on a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

D. Nonconforming Structures in the Floodway. A nonconforming building or structure (whether residential or non-residential) in the Floodway may be improved or repaired only if it complies with all of the following:

1. A nonconforming building or structure (whether residential or non-residential) in the Floodway may not be expanded by addition of square footage, footprint, or Habitable Space.

2. If the work to improve or repair a nonconforming building in the Floodway is the result of Substantial Damage to the building through a flood or other natural hazard event, the applicant will have five years from the date of loss to begin the work. At the expiration of the five-year period, the applicant may petition the County Engineer for a single one-year extension.

3. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Floodway proposes a Substantial Improvement or repair of

Substantial Damage, the owner shall complete the following steps in the following order:

a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.

(i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.

(ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

(iii) Permanent removal of encroachments in the FEMA or Boulder County Floodway may qualify the owner for bonus Transferable Development Credits pursuant to section 4-1303.

(iv) Relocation to less hazardous locations is strongly encouraged, but not required.

(v) If a nonconforming building or structure is relocated to a less hazardous location, the retrofitting requirements below may be reduced or eliminated at the discretion of the County Engineer.

b. Retrofitting Existing Buildings.

(i) In addition to requiring conformance with the flood protection measures in section 4-405, the County Engineer shall require one or more of the following retrofitting techniques to protect the entire residential building or structure from flood inundation as well as scour and erosion, debris impact, and other potential hazards associated with floodways:

1) Elevation using Posts, Columns, or Piles

i. Posts or columns must be placed in drilled or excavated holes or piles must be driven into the ground.

ii. Posts or columns must be encased in concrete and include a footer.

iii. Posts, columns, and piles must be sufficiently anchored to resist the expected hydrodynamic and hydrostatic flood forces.

iv. Access may be allowed to extend below the FPE.

2) Elevation using stem walls parallel to the direction of flow

i. Water must be allowed to flow freely at high velocities between stem walls.

ii. Footers must be designed and installed to account for potential scour associated with flooding.

3) Other techniques proposed by the applicant as determined by the County Engineer on a case-by-case basis.

(ii) In all cases, the bottom of lowest horizontal structural member (floor joists) as well as all service equipment must be above the FPE.

(iii) In all cases, a continuous load path from the retrofitted foundation to the elevated portion of the home is required.

(iv) For non-residential buildings, the applicant must first consider the retrofit requirements for residential buildings in this subsection, but at a minimum, the requirements of 4-405(C) apply.

(v) All Floodway retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. In addition to the Elevation Certificate requirements of 4-405(J), residential building retrofit projects require completion of the Boulder County Residential Floodway Retrofit Certificate. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).

4. Work on a nonconforming building or structure (whether residential or non-residential) in the Floodway that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

E. Nonconforming Uses.

1. The use of any structure or property within the FO District that was lawfully established before the adoption or amendment of this Article 4-400, but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1003.

2. A change in use (as uses are defined in Article 4-500) of a structure will require that the entire structure be flood-protected pursuant to Section 4-405; provided, however, that the County Engineer may modify or waive flood protection

requirements for a change in use based on good cause shown by the applicant that all of the following conditions are met:

a. The entirety of the existing structure is located outside of the Floodway;

b. The existing structure is determined to be structurally sound by a qualified engineer licensed in Colorado;

c. The value of any work associated with the change of use is less than 50% of the current value of the structure;

d. The proposed change in use is to a use that is permitted in the zone district applicable to the property;

e. The proposed change in use is to a use that reduces, minimizes, or otherwise creates a less intensive use or decreases human occupation; and

f. There is no other potential for any significant conflict with this Article 4-400.

4-414 Definitions

Accessory Building or Structure. A building or structure which is on the same parcel of property as a principal or primary building and the use of which is incidental to the use of the principal or primary building. Examples include, but are not limited to, detached garages (but NOT ADUs), storage sheds, barns, boathouses, and pavilions.

Alteration of a Watercourse. Through man-made work, changing the the bankfull channel such that the post-project location, orientation, or flow direction of said channel extends three or more bankfull channel widths from the pre-project channel location, or outside of the pre-project regulatory floodplain.

Article 4-400. Sections 4-400 through 4-416 of the Boulder County Land Use Code.

Basement. Any area of a building having a finished floor subgrade on all sides, where the finished floor is greater than four feet below the top of the foundation walls or greater than 2 feet below the Lowest Adjacent Grade.

Below-Grade Crawlspace. The interior space between the elevated finished floor of a building and the finished interior grade, where the finished grade is no greater than 4 feet below the top of the foundation walls and no greater than 2 feet below the Lowest Adjacent Grade.

Crawlspace. The interior space between the elevated finished floor of a building and the interior finished grade.

Critical Facilities. A structure or related infrastructure, but not the land on which it is

situated, as specified in CWCB's Rules and Regulations for Regulatory Floodplains in Colorado at 2 CCR 408-1:6, 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.

Habitable Space. An enclosed area having more than 20 linear feet of finished interior walls (paneling, etc.) or used for any purpose other than solely for parking of vehicles, building access or storage.

Flood Fringe. The portions of the Floodplain Overlay District that are not in the Floodway.

Floodway. ~~The floodway depicts the most hazardous portion of the floodplain, where flood depths and velocities are greatest and damages resulting from flooding are the most catastrophic. As such, Boulder County's development restrictions in the floodway are stricter than those within the Flood Fringe. In Boulder County, Floodway means:~~

Those portions of the FO District required for the passage or conveyance of the ~~base flood~~ 1% annual-chance (100-year) flood in which waters will flow at significant depths or with significant velocities, including the channel of a river or other watercourse and any adjacent floodplain areas that must be kept free of development and other encroachments in order to protect the health and safety of the residents of and visitors to Boulder County, and to discharge the ~~base~~ 100-year flood without cumulatively increasing the water surface elevation more than a designated height (also called 'surcharge' and described in Section 4-404.2(E)(3)).

a. ~~The Colorado statewide standard for the designated height to be used for all newly studied reaches is 0.5 foot.~~

b. ~~For existing Floodway delineations in previously studied reaches, the designated height is that in place at the time of the study. This information is on file with the County Engineer and available upon request. Letters of Map Revision to existing Floodway delineations may continue to use the floodway criteria in place at the time of the original delineation.~~

~~2. Areas identified as floodway by the Colorado Water Conservation Board or FEMA.~~

~~3. In the foothill canyons and in any drainage above 6,000 feet (NAVD88) in elevation, as a result of the expected high flow velocities, with reference to the best terrain data available as of the last FO District update, (a) the entirety of the 1%-annual-chance (100-year) flood hazard area, or (b) as reflected on an engineering study approved by the County Engineer and available upon request.~~

~~4. In Zone A or AE areas, where the proposed development does not involve buildings or structures, then in the absence of either a specific floodway designation by FEMA or an engineering study submitted by the applicant and approved in writing by the County Engineer, the Floodway is defined as the channel or flowpath of the river, stream, or~~

~~other watercourse and areas of the floodplain where the product of flood depth (in feet) multiplied by flood velocity (in feet per second) is greater than four. This formula is derived from the 1987 Colorado State University flume study. Flow depth and velocity can be determined from a number of sources, including without limitation hydraulic modeling, water surface elevation information, terrain data, and flood risk products created specifically to display depth and/or velocity.~~

~~5. Where the proposed development involves buildings or structures in the FO District and the floodway has not been previously identified, the Floodway is those portions of the FO District determined to be floodway by an engineering study submitted by an applicant and approved by the County Engineer as further described in Section 4-404(E).~~

In-Kind Replacement. For storm drainage systems and system components, replacement of any system or system component with the same system or component. In-kind Replacement does not include projects that will change the size or function of the system or component.

Letter of Final Determination. A letter FEMA sends to the Chief Executive Officer of a community stating that a new or updated FIRM or DFIRM will become effective in 6 months. The letter also notifies each affected floodprone community participating in the NFIP that it must adopt a compliant floodplain management ordinance by the map effective date to remain participants in good standing in the NFIP.

Letter of Map Amendment ("LOMA"). FEMA term meaning an amendment to the currently effective FEMA map, issued only by FEMA, which establishes that a property is not located in a Special Flood Hazard Area.

Letter of Map Revision ("LOMR"). FEMA term meaning an official amendment to the currently effective FEMA map, issued by FEMA, which changes flood zones, delineations and elevations.

Lowest Adjacent Grade. The lowest point of the ground level immediately next to a building.

Maintenance. Maintenance means any routine or regularly-scheduled activity undertaken to repair or prevent the deterioration, impairment, or failure of any utility, structure, or infrastructure component. Maintenance includes activities to restore or preserve function and/or usability of a storm drainage, water delivery, or ditch system. Such activities may include, without limitation, the removal or movement of sediment, debris, and vegetation, installation of erosion and sediment control devices, stabilization of stream channel and/or water delivery channel (ditch) banks, and the replacement of structural components, so long as the work substantially conforms to the most recent County-approved design, flow condition, and vertical grade, as applicable. Maintenance does not include expansion or enlargement of a building or structure, Substantial Modifications, Substantial Improvements, total replacement of existing facilities, or total reconstruction of a facility.

Permanent. Any change or alteration expected to remain for a substantial period of time,

but at a minimum will remain after permitted work is complete.

Soil Treatment Area. See Boulder County OWTS Regulations (April 2015), as amended.

4-415 Interpretation

Certain terms used in this Article 4-400 are derived from FEMA and/or CWCB regulations. The federal and state definitions of these terms may not correspond precisely to county definitions of the same or similar terms as used elsewhere in the Land Use Code and related local regulations such as the Building Code. To the extent a term is not defined in this Article 4-400, and a conflict or inconsistency in the meaning of the term cannot be resolved by the principles listed in sections 1-900 and 1-1000, the County Engineer must determine the meaning of the term by examining the following sources in the following order of priority:

1. The meaning of the term as defined in Article 4-400.
2. The meaning of the term as defined in Article 18 of this Code.
3. The meaning of the term as defined by FEMA. See 44 C.F.R. § 59.1, as amended.
4. The meaning of the term as defined by CWCB. See 2 C.C.R. 408-1:4, as amended.
5. The meaning of the term as defined elsewhere in this Code, or in another adopted Boulder County publication such as the Multimodal Transportation Standards, the Storm Drainage Criteria Manual, or the Stormwater Quality Management Permit Requirements.
6. The meaning of the term as defined in any other official document deemed a reliable source of authority given the context.

4-416 Enforcement

Upon receiving a complaint that a violation of the requirements of this Article 4-400 has occurred, the County Engineer is authorized to enforce compliance with these floodplain regulations in the same manner as other violations of the Land Use Code are enforced, as detailed in Article 17.

Exhibit E1: Summary table of proposed code changes

Change Number	Code Major Section No.	Minor Section No.	Description of Change	Explain why this change is necessary
1	4-402	(F)(2)	Last sentence should read '…or the County Engineer has determined that a FDP is **NOT** required."	The unintentional omission of the word 'not' from the October 2016 code adoption changed the meaning of this subsection.
2	4-403	(A)(2)(c)	Removed initial from 'The following reports, maps…constitute~~s~~ the ~~initial~~ location…'. Also, added language on periodic adoption of new flood hazard information. Removed mention of Love, 1992 study of the North and Main St Vrain as defining the Boulder County Floodplain. Removed (ii) 'Any area included in the definition of Floodway per Section 4-414.'	These changes are necessary to allow for updates to the FO District through zoning map adoption to occur without the need for a code text amendment. Also reflects the proposed changes to the Section 4-414 Floodway definition whereby the definition is considerably shorter than previously and does not on its own define areas as Boulder County Floodway.
3	4-403	(A)(2)(d)	Removed ', as well as any areas described in the Floodway definition,'	To reflect the proposed changes to the Section 4-414 Floodway definition whereby the definition does not on its own define areas as Boulder County Floodway.
4	4-403	(C)(1)	Removed previously from 'The County Engineer shall determine which uses, parcels, structures, or other facilities are located in an ~~previously~~ adopted FEMA Floodplain or a Boulder County Floodplain ….'	Clarification.
5	4-403	(C)(5)	Changed 'boundary lies' to 'boundaries lie', clarified 'Engineer' means 'County Engineer'	The first change clarifies that interpretation can apply to all boundaries within the FO District (including Floodway); not just the FO District boundary itself. The second change was to correct an omission of the word County in 'County Engineer'.
6	4-403	(D)(3)	This section deleted .	This section repeats information already contained within Boulder County land Use Code Section 4-1100 and 44CFR70.3.
7	4-403	(D)(5)(a)	Added relocated language on revision/amendment of existing Floodway delineations from the existing Floodway definition in Section 4-414.	The addition of this language is necessary to refer people that wish to revise the FO District where a Floodway exists to the modeling section 4-404.2(E) and to the appropriate Floodway surcharge criteria, as-applicable. This language has same effect as similar currently existing language in 4-414 Definitions.
8	4-404	(A)	Language added to clarify that A only applies to development projects that are **allowed** in the floodway.	Existing language was misleading.
9	4-404	(B)	Insert portion of Floodway definition here. Also, 'The following activities and uses are prohibited within all ~~mapped~~ floodways'	Distribution of portions of the Floodway definition throughout the code (in this case, to 404 where it describes the Floodway). Also, removed the word 'mapped' because floodway may be delineated by definition.
10	4-404	(B)(15)	Added 'above-ground oil and gas operations as defined in Article 12-1400' to list of prohibited uses in the Floodway.	The prohibition is already included in Article 12 but should also be included where people will look for it in Article 4-400 floodway prohibitions.
11	4-404	(C)(2)	Add reference '…that the proposed encroachment **is in compliance with the provisions of 4-404.2(E).'**	Reference made to modeling section. Also previously existing language describing need for CLOMR, LOMR, and local floodway review has been relocated from this section to 4-404.2(E)(4).
12	4-404	(C)(3)	Add language concerning development within areas of ineffective flow in Floodway areas above 6,000 feet.	This language is necessary to direct applicants that wish to propose a use or development within the Floodway above 6,000 feet that they may only do so if they are able to demonstrate that areas of ineffective flow (low velocity and therefore not likely a Floodway-type hazard) exist.
13	4-404.1	(A)	Replace floodplain with FO district as follows: '…certain limited uses and activities in the ~~floodplain~~ **FO District** without the need for…'	Clarification to differentiate 'Floodplain' from 'FO District'. Article 4-400 governs the FO District.
14	4-404.1	(F)	Removal of words ~~'…to the owner'~~	Removal of reference 'to the owner' since there could be an agent applying on behalf of an owner, etc.
15	4-404.2	(B)(1)(d)	Moved 'adequate evidence of either direct ownership …. ' from end of Section 4-404.2(B) to earlier in the Section.	It is a requirement for all individual FDPs
16	4-404.2	(B)(2)	Moved 'For projects in the floodway' up higher in Section. Removed depth x velocity procedure for delineating floodway in Plains that was not acceptable to FEMA.	Requirements for ALL floodway projects needed to be higher in the section. Per FEMA, depth x velocity procedure did not address encroachments sufficiently.
17	4-404.2	(B)(3)(g)	Add reference to a floodway analysis that is required for projects below 6,000 feet that involve proposed buildings. From existing Floodway definition.	This language is necessary to align with floodway defintion and Boulder County policy, to ensure all new buildings are outside of the floodway, that any new buildings proposed in FO District areas without a floodway must first establish a floodway boundary.
18	4-404.2	(B)(3)(h)	Relocate existing language listing requirements for new development of 5 acres or 50 lots or greater from 4-404(C)(2) to section on submittal requirements for New Construction/buildings.	This item does not fit in it's current location; a better fit exists in 4-404.2(B)(3)
19	4-404.2	(B)(4)(c)	Change to 'Documentation, **including hydraulic modeling,** that addresses scour…	Change is necessary to emphasize that, per Boulder County Storm Drainage Criteria Manual, hydraulic modeling is required in order to properly size and design water crossings .
20	4-404.2	(E)	Changed 'procedures for modeling development in the floodway' to 'procedures for modeling development within the FO District'.	This section also talks about modeling requirements for projects that do not have a floodway.
21	4-404.2	(E)(1)	Edited introductory language -- about modeling procedures -- for clarification. Intent unchanged.	Language change clarifies that this section on modeling applies to floodway aras as well as areas that may not have a floodway identified.
22	4-404.2	(E)(2)(b)	In 4-404.2(E)(2)(b), add language on updating flood discharges (taken from existing 4-404.2(E)(2)(e) and re-worded).	This change provides clarification on the application of updated flood discharges to new modeling for a proposed project.
23	4-404.2	(E)(2)(b)	Remove language ~~'…by measuring from the effective FIRM.'~~	Remove reference to the effective FIRM as there may be times where the Boulder County flood hazard information is used, or another study. This is a FEMA standard language remnant
24	4-404.2	(E)(2)(d)	~~These results must demonstrate no impact to the 100-year water surface elevations..~~	Removed from this section and redistributed as 4-404.2(E)(4) in order to provide clarity on procedures
25	4-404.2	(E)(3)	Insert reworded portion of Floodway definition here.	This language has been removed from the current Floodway definition and moved to a more pertinent location, where Floodway modeling is discussed.
26	4-404.2	(E)(4)	Portions of existing subsection 4-404(C)(2) - relocate to 4-404.2(E) and redistribute in other sections as well. Also, reworded to describe more simply when CLOMRs, LOMRs, and local floodway reviews are required.	This language has been moved to a more proper location (the modeling section) and the logic statements have been simplified for the user. No updates to requirements have been made.
27	4-404.2	(E)(4)(d)	Reworded and added language to 'In all instances, no increases in water surface elevation will be allowed that impact an insurable building' to become 'Any increase in water surface elevations **that are a direct result of a man-made development project** and that impact an insurable building will not be allowed.'	Reworded this item and moved from 4-404(C)(2)(g). Language added to clarify that natural changes within the watershed may cause increases on insurable structures and this would be acceptable.
28	4-404.2	(E)(5)	Added from 4-404(C)(2).	Language moved to a more proper location. Same as above.
29	4-405	(A)(1)	In areas depicted as Zone AE **and AH** in the FO District…	Language updated to include all possible A zones.
30	4-405	(A)(2)(c)(i)	For buildings, the FPE will be 3 feet above the highest grade within the proposed building footprint, or the highest grade adjacent to the exterior of the existing building, unless the applicant supplies information sufficient to determine a BFE and subsequent FPE for the building, ~~including data submitted as a part of identifying the Floodway boundary pursuant to the Floodway definition in 4-414.~~	Revised because distribution of Floodway definition makes the stricken clause unnecessary.
31	4-405	(G)(2)(a)	Reworded to clarify less stict regulation of OWTS in flood fringe/other floodplain areas.	Provide clarity to strict prohibition of OWTS in the Floodway and less-strict in the flood fringe.
32	4-405	(G)(3)(b)(i)	Edited to remove clause : Tanks that are installed within the Boulder County or FEMA 500-year floodplain should be anchored to protect against uplift from high groundwater. ~~Where the 500-year floodplain is not shown, the anchoring requirement will apply if the lowest elevation of the tank is at or below the 100-year base flood elevation adjacent to the tank location~~.	Clause applied to area outside the FO district. Removed because this requirement applied to areas outside FO district.
33	4-405	(G)(4)(b)(ii)(b)	Added 'or below-' , 'Whether there is room for an at **or below**-grade recircualting sand filter…..'	To clarify that below grade is acceptable in addition to at grade.
34	4-413	(B)(3)	Added FPE : '…results in a higher BFE**/FPE** such that…'	It's necessary to add FPE because in some instances, a Base Flood Elevation will not be used but a flood depth will (Zone AO), which has an associated FPE.
35	4-414	Definitions	Exisitng floodway definition distributed throughout code rather than left in definitions.	Floodway definition has been updated to simply definition and to redistribute additional Floodway criteria throughout pertinent sections of 4-400.

Shading indicates a proposed text change that is discussed further in the attached description of select substantive proposed code changes

Exhibit E2: Description of Select Substantive Proposed Code Changes

4-403 FO District Defined; Official Map

Section 4-403(A) defines the FO District – where the floodplain regulations in Article 4-400 apply -- as the FEMA Floodplain together with the Boulder County Floodplain. Section 4-403(A)(2)(c) defines the location and boundaries of the Boulder County Floodplain.

Staff proposes to edit 4-403(A)(2)(c) as shown here:

c. The following reports, maps, and related information constitute~~s~~ the ~~initial~~ location and boundaries of the current Boulder County Floodplain:

(i) ~~Floodplain Re-analysis and Floodway Delineation, North St. Vrain and St. Vrain Creeks, Boulder County, CO, by Love & Associates, Inc., October, 1992; and~~Any flood hazard or flood delineation report as adopted by the Board of County Commissioners in accordance with Article 4-1100 depicted on the Boulder County Floodplain official digital map.

~~(ii) Any area included in the definition of Floodway per Section 4-414.~~

d.The maps in these reports~~, as well as the area described in the Floodway definition,~~ depicting the floodplain for the base flood shall be considered the official maps for the purposes of locating the Boulder County Floodplain on the official zoning district maps. These maps and reports, together with all amendments, explanatory matter, technical addenda, water surface elevations, profiles and cross sections (where available) are incorporated by reference into this Code.

This change is being made for the following reasons:

1. To revise the current specification of the "initial" Boulder County Floodplain with a provision that allows the Boulder County Floodplain to be updated by adoption of best available data through the appropriate zoning map amendment process as future flood hazard studies become available.
2. To eliminate the explicit mention of the Love, 1992 study of North St. Vrain and St Vrain Creeks as contained within the Boulder County Floodplain and Floodway. The Love, 1992 study was explicitly added during the DC-15-0004 code changes to ensure that docket maintained the existing regulatory Boulder County Floodplain that was not FEMA Floodplain. With docket Z-17-0001, the Love, 1992 study is superseded by the adoption into the Boulder County Floodplain in the same location of the CHAMP study.
3. To reflect the proposed changes to the Section 4-414 Floodway definition whereby the definition does not on its own define areas as Boulder County Floodway.

Staff believes that the proposed change preserves the intent of the original language of this section and that the change was a contemplated evolution from DC-15-0004 creating the Boulder County Floodplain, to DC-17-0001, revising the code to create a process that will continue to be appropriate for continuing comprehensive zoning map amendments to the Boulder County Floodplain.

4-414 Definitions – Floodway

Section 4-414 contains definitions for terms used in Article 4-400, including 'Floodway'. Section 4-414 is intended to be a reference for both County staff and residents to refer to for clarification about technical terms.

Staff proposes to distribute the majority of the existing lengthy Floodway definition from its location in Section 4-414 near the end of Article 4-400, to more appropriate locations throughout Article 4-400, leaving a much shorter definition of Floodway in Article 4-414.

The following edits occurred to the remaining definition:

> **Floodway.** Those portions of the FO District required for the passage or conveyance of the ~~base flood~~ 1% annual-chance (100-year) flood in which waters will flow at significant depths or with significant velocities, including the channel of a river or other watercourse and any adjacent floodplain areas that must be kept free of development and other encroachments in order to protect the health and safety of the residents of and visitors to Boulder County, and to discharge the ~~base~~ 100-year flood without cumulatively increasing the water surface elevation more than a designated height (also called 'surcharge' and described in Section 4-404.2(E)(3)).

Staff believes that the proposed Floodway definition maintains the intent of the existing definition but is much more approachable to code users and aligned with the FEMA and CWCB definitions of Floodway.

No other changes are proposed to Section 4-414 Definitions.

Floodway Above 6,000 foot elevation

Section 4-404, Floodplain Development Permits, includes regulations pertaining to allowed uses within the Floodway and Flood Fringe of the Floodplain. Section 4-404(C) describes uses allowed in the Floodway under certain conditions.

Staff proposes to add a new subsection (3) to Section 4-404(C) as shown here:

> 4. For Floodway areas above 6,000 feet in elevation, uses other than those described in 4-404(C)(1) above may be allowed at the discretion of the County Engineer if the proposed use or development will occur within an area of ineffective flow,

This proposed addition allows applicants in areas of the Floodway above 6,000 ft elevation that are ineffective flow (example: a backwater or eddy) to request approval of uses that might otherwise be prohibited by the code. This addresses the concern of residents who have in the past proposed, for example, to place septic systems in a backwater floodplain area above 6,000 feet. Under the existing code, this request could not be permitted. The proposed code will allow for appropriate flexibility by enabling the County Engineer to review the materials presented in a particular application about the nature of the flow in the project location, and the potential activity's effect on the floodway and the health and safety of residents, and to potentially permit the activity where it is demonstrated there is not an adverse impact on the floodway or a significant safety hazard.

In alignment with the new Section 4-404(C)(3) described above, staff further proposes to relocate the portion of the existing definition of Floodway in Section 4-414 that describes floodway above 6,000 ft elevation as coincident with the regulated floodplain to a more appropriate location in Section 404.2(E)(3)(b):

3. For Floodway modeling, the following surcharge criteria apply:

b. In the foothill canyons and mountain areas above 6,000 feet in elevation, as a result of steep channel slopes, high flow velocities, and erosive forces, and to reserve areas of active flow such that those areas are free of development and other encroachments, a 0.00-foot surcharge shall be applied to all reaches studied by detailed and approximate methods (Zone AE and Zone A).

In addition to relocating this language to Section 404.2(E)(3)(b), some clarifications are proposed, while maintaining the existing intent. The proposed provision of a 0.00 foot "surcharge" for floodway above 6,000 foot elevation, has the same effect as the previous definition stating the floodway above 6,000 foot elevation is coincident with floodplain.

Exhibit F: List of public comments received on draft floodplain mapping

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
1	Phone	2/3/2017	36908 Boulder Canyon Dr	Boulder Creek	Called with concerns about the topography data near his property - concerned that the topography is not accurately represented just downstream of his home. The area to the right (downstream) of his studio is also not topographically accurate.	2/3/2017	phone; Boulder County	Concern sent to the CHAMP team for consideration	Topography is based on 2014 LIDAR data. The house is on the edge of the 100yr floodplain with a depth of approximately one foot. There could be an opportunity for an elevation certificate to verify the elevation once mapping is finalized.
2	Web Map Comment	4/14/2017	27220 Boulder Canyon Dr.	Boulder Creek	The true floodplain edge doesn't actually overlap the corner of this structure. Can a more detailed examination be undertaken to accurately resolve this point?	4/14/2017	Boulder County, phone	Staff spoke with resident and explained the draft nature of the mapping along with options available to him in the event that he wants to look into a map amendment or obtain survey data for accurate information.	Comment to be shared with CHAMP in future review period
3	Phone	4/14/2017	27220 Boulder Canyon Dr	Boulder Creek	Called with questions about the mapped floodplain boundary on his property; A single structure (a barn) is touching about 1 foot of the floodplain and he was wondering if a survey would be required to get this structure out.	4/17/2017	Boulder County, phone	Staff spoke with resident and explained the draft nature of the mapping along with options available to him in the event that he wants to look into a map amendment or obtain survey data for accurate information.	Comment to be shared with CHAMP in future review period
4	Phone	4/19/2017	40420 Boulder Canyon Dr	Boulder Creek	Looked at map, will call back if he has more questions	4/19/2017	Boulder County, phone	Staff spoke with resident and looked at his property on the online maps.	Comment to be shared with CHAMP in future review period
5	Jan 19 Public Meeting	1/19/2017	20 properties at Coyote Hill (Owners) Association	Cabin Creek	Comment written on map: [drew in Coyote Hill Rd. on printed map that should have been identified on the maps]	general response	Boulder County	Thank you for your input.	No response provided
6	Web Map Comment	2/20/2017	77 CR 82E, Allenspark, CO 80510	Cabin Creek	this structure is an old shed in disrepair; not insurable	n/a		Response provided by CHAMP	No response provided
7	Jan 10 Public Meeting	1/10/2017	not provided	Dry Creek #2	looking for stewardship guidance on how to manage floodplain land	1/24/2017	email; Boulder County	Referenced a local program offering similar pre-disaster land management outreach	No response provided
8	Jan 10 Public Meeting	1/10/2017	not provided	Dry Creek #2	95th & Oxford Rd; channel is located on the eastern edge of the floodway boundary	3/28/2017	CHAMP	Response provided by CHAMP	We agree with this statement. There is a well defined channel to the east in this reach. Channel is contained in floodway.
9	Jan 10 Public Meeting	1/10/2017	not provided	Dry Creek #2	Comment written on map: "How much error is allowed in the modeling? Will the public be shown a map with error bars for each of the flood areas?"	3/28/2017	CHAMP	Response provided by CHAMP	All engineering calculations are done within standard practice. 1%+ profile is a calculation of the standard deviation for the 100yr storm. This error calculation can be seen on the stream profiles.
10	Feb 23 Public Meeting	2/23/2017	7875 N 95th St, Longmont	Dry Creek #2	See scan of comment and cross section diagram; Interested in having CHAMP optimize the floodway near his property	3/7/2017, 3/30/17	regular in-person communication & email; Boulder County, CHAMP	Response provided by CHAMP	The cross sections called into question are currently optimized. Moving encroachments more than 10 ft on the left overbank causes surcharges greater than 0.5ft. The State guidelines for floodways specifies that surcharges must be between 0 and 0.5ft.
11	Phone	4/14/2017	4253 N 75th St	Dry Creek #2	Question about the PC hearing	4/14/2017	Boulder County, phone	Staff called resident and explained the nature of the PC Hearing	Staff response only
12	Direct Email	4/17/2017	7162 Christopher Court	Dry Creek #2	I will not be able to attend your meeting on April 19 and am unable to work with your website. Would appreciate knowing the floodplain classification for my residence at 7162 Christopher Court in Niwot. Thanks.	5/5/2017	Boulder County, email	Staff sent a screen shot of the map at this property and encouraged resident to access more information about the Floodplain Remapping Project on the county website and also to access the maps themselves for futher review.	Comment to be shared with CHAMP in future review period
13	Web Map Comment	4/18/2017	7995 Centrebridge Drive	Dry Creek #2	The area propsed as part of the 500-Year Floodplain behind our house did not flood during the major rainfall events of September 2013.	5/8/2017	Boulder County, email	"Thank you for your comment on our interactive webmap for reviewing draft floodplain data. We appreciate knowing that this area did not flood during the2013 event. This region did not experience a 500-year event according to our hydrologic analyses, so your comment supports that this is an area of lower flood risk."	Comment to be shared with CHAMP in future review period
14	Phone	4/18/2017	Niwot area	Dry Creek #2	In the Niwot area and was not flooded in 2013; a "100-year culvert project" has already been completed and she called to get clarification on the mapping process	4/18/2017	Boulder County, phone	Staff spoke with resident and explained the remapping process and what goes into the flood study. [Resident] appreciated the information	Comment to be shared with CHAMP in future review period
15	Jan 10 Public Meeting	1/10/2017	293 W. Coach 80302	Fourmile Canyon Creek	"I am concerned about the large amount of slash & fire mitigation debris that exist[s] in the watershed area north of the Ann[e] U White trail. Specific example is on my lot @ 293 W. Coach Road. This debris has been moved in the flood. It will go further down stream next time."	1/10/2017	conversation at meeting; Boulder County	Thank you for this information and concern. The Boulder County flood recovery and emergency management teams appreciate having been made aware of these concerns and issues related to hazardous debris.	No response provided
16	Jan 10 Public Meeting	1/10/2017	not provided	Fourmile Canyon Creek	Comment written on map: "Concern about fire mitigated debris all along the creek above Anne U White trail."	n/a		no contact info provided	No response provided

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
17	Phone	5/3/2017	4495 Ruby St	Fourmile Canyon Creek	Called looking for floodplain info on his property, concerned that flooding was being rerouted because he was not aware of floodplains nearby when he purchased property	5/3/2017	Boulder County, phone	Staff spoke with resident and gave him floodplain staff contact information at the City of Boulder; even though this is a county property, they may be more aware of any changes currently underway at this property and can explain the layers on their interactive webmap better than county staff.	Comment to be shared with CHAMP in future review period
18	Direct Email	3/20/2017	8795 Streamcrest Dr	Lefthand Creek (Phase II)	Called with questions about the remapping timelines for Lefthand Creek; concerned that LWOG projects are happening in her area before the new mapping comes and also has questions about flood insurance and what will change if mapping & projects bring the floodway & channel closer to her home.	3/20/2017	Boulder County, phone	Described planned Phase II timeline and estimated timeframes for new maps to be effective vs. new data to be adopted; Followed up with links to floodsmart.gov and some FEMA pages.	Comment to be shared with CHAMP in future review period
19	Direct Email	4/17/2017	15789 N 83rd St	Little Thompson River (Phase II)	"It looks like our house is not in the floodway, but may be in the proposed 100 yr floodplain, I have a question about the "AE" in what looks like a proposed new 100 yr flood plain, next to our house. What does it mean? I'm also really curious abut the way the 100 and 500 yr floodplains meet just west of our house. Is this something that will be explained on May 9th?"	5/5/2017	Boulder County, email	"Zone AE means that this a 100-year floodplain zone that incorporated a "detailed study". This means that they used field surveys in addition to LiDAR topographic surveys to develop the hydraulic model in this area. As for the 100-year and 500-year zones near your house, yes, there will be staff present to help explain these determinations. In a nutshell, the LiDAR topo imagery is used to create contour intervals and the water surface elevations... that identify the flood risk zones."	Comment to be shared with CHAMP in future review period
20	Jan 31 Public Meeting	1/31/2017	subsection of river reach	Lower Boulder Creek	"Concerned about actual elevations vs. modeling"; Geoff U. notes: For LaFarge property along Boulder Creek between BC_49 to BC_51. Specifically, piles/rubble has moved around significantly and would like to see existing LiDAR used in area to compare that topo to new survey being collected. May collect additional survey on property. Requested screen shot of property with elevations posted.	3/8/2017, 3/28/17	email; Boulder County, CHAMP	Landowner was sent screen shots of LiDAR contours near LaFarge property along Lower Boulder Creek	Mapping is based on 2014 lidar that is best available data.
21	Feb 23 Public Meeting	2/23/2017	11692 Kenosha Rd, Longmont	Lower Boulder Creek	Detailed comments on scanned document; Would like to see his property removed from the floodway based on 2013 experienced conditions	3/14/2017	in-person communication, phone conversations; Boulder County	Provided detailed information to CHAMP, and replied to March 14 questions with input from Boulder County Floodplain Management Team	The property in question is well within the 100yr floodplain but a floodway has not yet been developed for this reach of Boulder Creek. And although the roadway at the north end of the property is at high ground, we are unable to assume that it offers flood protection to the south. Roadways are classified as non-levee embankments and are not modeled to protect areas from flooding.
22	Comment Form	2/21/2017	2478 Eldora Rd	Middle Boulder Creek	"1. For a 100-year flood, what would the cfs be at the Middle Boulder Creek at Nederland (BOCMIDCO) gaging station? This gives me a relative value that I can relate to normal flows on the creek. 2. How much precipitation (inches of rain?) would result in a 100-year event? 3. Specific to my property, a part of the west portion is mapped in Zone A. This area is north of CR 130, which is between the property and the creek. Was the raised bed of CR 130 taken into account?"	3/3/2017, 3/30/17	email; Boulder County, CHAMP	Referenced modeled/experienced discharge data and the BoCo Storm Drainage Criteria Manual to answer questions #1 and #2. #3 passed on to CHAMP for consideration (model where road intersects).	3. Yes. For base level streams, cross sections were placed on top of the roadway as well as upstream and downstream of structures. This captures the channel restriction caused by structures. At the west end of the property in question, the roadway is at an average elevation of 8598ft (which is almost 8ft higher than the ground upstream). The 100yr storm overtops the roadway and reaches a water surface elevation of 8600ft.

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
23	Comment Form	3/13/2017	550 & 945 Bryan Ave, Eldora	Middle Boulder Creek	I assume the grey slanted lines indicate the 100 year floodplain? What does that mean in terms of insurance if the grey lines are slightly outside my property? I tried to find 945 Bryan Avenue, Nederland, CO on your map, but when I type in that address I get nothing. But when I play with the map I find that location. So it the computer doesn't recognize that address then I can't comment on it? And your website is a pain! I'm not an idiot, but I can't figure out your directions to zoom in on the area I'm interested in, click on the yellow dot, which results in a temporary red dot and a place where I can comment. It doesn't work that way! Who has access to this information? Is it sent to home insurance companies? Does it result in a site review of properties? If so, which properties? Just properties in the 100-year floodplain?	3/14/2017	email; Boulder County	Staff explained details of the webmap layers and the challenges of using the address search within the webmap (directed resident to Property Search). Staff also attempted to provide clearer instructions for commenting on the webmap. Finally, staff explained the public nature of the map data as well as the general process that was undertaken for surveys at the time data was being collected. If resident would like detailed surveys done on the property, that is something that is up to the individual to pursue.	No response provided
24	Web Map Comment	12/5/2016	2373 Riverside Drive Lyons CO	Middle St. Vrain	This point is approximately 150 feet above the river bed. The purple floodway path on the map bears no relation to the topography .	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
25	Web Map Comment	12/5/2016	2373 Riverside Dr Lyons CO	Middle St. Vrain	This road does not exist on plat or in reality.	general response	Boulder County	The basemaps available for use on the webmap platform do not incorporate county road or structure information, they simply serve as background imagery to help orient users to the map. We apologize for the inaccuracies.	No response provided
26	Web Map Comment	12/5/2016	2373 Riverside Dr	Middle St. Vrain	The draft plan in this area in manifestly wrong as can be seen by reference to the regulatory plan (the plat plan is pretty wrong too but that's another matter	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
27	Web Map Comment	12/7/2016	2931 Riverside Dr, Lyons Colorado	Middle St. Vrain	Our cabin, well, and septic system were not touched by the 2013 flood, but I can not tell from your draft maps if we are included in the flood plain, I do not believe we should be.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
28	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	This structure is out of place on parcel boudaries by about 100 feet, same as it has been shown since 2006 when we bought the place. I thought this was supposed to be a more accurate map.	general response	Boulder County	Structure and parcel lines are separate datasets from the floodplain mapping data. We apologize for the inaccuracies.	No response provided
29	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	Elevation is 7789 ft per Van Horn Engineering survey for Bridge Permit approved 11/13/15 # 15-2245. Note this is 8 ft above bottom of creek channel	3/28/2017	CHAMP	Response provided by CHAMP	Agree that home is at an elevation of about 7789ft. The water surface elevation for the 100yr is also approximately 7789 ft. so the home is mapped within the floodplain. Floodway analysis is under review.
30	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	Elevation bottom of channel is 7781.3 ft ft per Van Horn Engineering survey for Bridge Permit approved 11/13/15 # 15-2245. Parcel lines are wrong by about 100 ft.	3/28/2017	CHAMP	Structure and parcel lines are separate datasets from the floodplain mapping data. We apologize for the inaccuracies.	This is Boulder County's parcel database.
31	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	Elevation is 7792 ft per Van Horn Engineering survey for Bridge Permit approved 11/13/15 # 15-2245. Since flood plain approches the 7800 ft contour on other side, road is under water by 8 ft.	3/28/2017	CHAMP	Response provided by CHAMP	Water surface elevation at the upstream and downstream cross sections are 7791.17 ft and 7786.22 ft, respectively. The 100yr storm does not flood the roadway in this location. The 500yr storm is at an elevation of about 7792 ft in this location. It is possible that there would be shallow flooding on the roadway in the event of a 500yr storm but the roadway is not mapped within the floodplain.
32	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	If this is the flood plain, the house across the street has water touching it also. Something is way wrong here.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
33	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	Elevation of property corner is 7785 ft per Van Horne Engineering survey for Bridge Permit approved 11/13/15 # 15-2245. However, this parcel corner is about 100 ft in wrong place downstream.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
34	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	If BoCo expects accurate point of concern discussion, BoCo need to provide a map with parcel lines and creek position much more accurate than this one.	general response	Boulder County	Structure and parcel lines are separate datasets from the floodplain mapping data. We apologize for the inaccuracies.	No response provided

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
35	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	The Hydraulic Report submitted with bridge permit # 15-2245 does not agree with the purple floodplain area. The Hydraulic Reports are required by BoCo and cost me thousands of dollars. Use that data	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
36	Web Map Comment	12/8/2016	2763 Riverside Dr	Middle St. Vrain	BoCo Has required numerous property owners along this reach, at considerable expense, to provide survey and hydraulic reports for permits. That data is more accurate than this goofy map, so use it.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
37	Web Map Comment	1/9/2017	1506 Riverside Drive	Middle St. Vrain	Our home, well, and septic system were not touched by the 2013 flood. We do not believe this home should be listed in either the 100 or 500-Year Floodplain.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
38	Web Map Comment	1/16/2017	2345 Riverside Dr	Middle St. Vrain	This map is completely wrong in this area. The contours on the map are not accurate! The slope is near vertical! The property lines are off about 50 feet!	3/28/2017	CHAMP	Response provided by CHAMP	Please provide technical information for this area. Topography data is based on 2014 LIDAR data. Property lines are from Boulder County's parcel database.
39	Web Map Comment	1/16/2017	2345 Riverside Dr	Middle St. Vrain	This road is not there, there has never been a road here!	general response	Boulder County	The basemaps available for use on the webmap platform do not incorporate county road or structure information, they simply serve as background imagery to help orient users to the map. We apologize for the inaccuracies.	No response provided
40	Web Map Comment	1/16/2017	2347 Rivderside Drive, Lyons, CO	Middle St. Vrain	This map is obviously wrong as this road does not exist nor does it cut through the residence on this site.	general response	Boulder County	The basemaps available for use on the webmap platform do not incorporate county road or structure information, they simply serve as background imagery to help orient users to the map. We apologize for the inaccuracies.	No response provided
41	Web Map Comment	1/16/2017	2356 Riverside Drive, Lyons, CO	Middle St. Vrain	Don't know how this property can be in the 100-year flood plain as shown on this map. This proprty amd residence was not impacted at all during the flood of 2013 which exceeded the 100-year event.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
42	Web Map Comment	1/16/2017	2356 Riverside Dr., Lyons, CO	Middle St. Vrain	There was absolutely no water on this lot or impact to this dwelling during the flood of 2013 which I understand was a 500-yr event. Looks like this mapping is incorrect and needs to be redone.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
43	Web Map Comment	1/16/2017	2356 Riverside Drive, Lyons, CO	Middle St. Vrain	None of the properties on the north side of Riverside Dr were affected in 2013. The modelling appears to be flawed.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
44	Web Map Comment	1/18/2017	99 Riverside Dr.	Middle St. Vrain	There is no building at this location on this lot. Could it be mapped to the wrong parcel? Please note, 99 Riverside Dr. consists of 2 parcels.	2/3/2017	Boulder County	Explained parcel inaccuracies and that parcel, structure, and channel info will be shared with Assessor & GIS staff; will share these comments, highlighting the elevation information when shharing with state engineers	No response provided
45	Web Map Comment	1/18/2017	3202 Riverside Dr.	Middle St. Vrain	This building(s) were not impacted by floodwaters from the 2013 flood.	general response	Boulder County	Thank you for your input. The basemaps available for use on the webmap platform do not incorporate county road or structure information, they simply serve as background imagery to help orient users to the map. We apologize for the inaccuracies.	No response provided
46	Web Map Comment	1/18/2017	3202 Riverside Dr.	Middle St. Vrain	This building was not directly impacted by the 2013 flood.	general response	Boulder County	Thank you for your input.	No response provided
47	Web Map Comment	1/18/2017	3202 Riverside Dr.	Middle St. Vrain	This building, as well as most of the buildings along this section of the creek were not inundated by the 2013 flood.	general response	Boulder County	Thank you for your input.	No response provided
48	Web Map Comment	1/18/2017	3202 Riverside Dr.	Middle St. Vrain	The shape and location of the floodway as well as the 100 year floodplain do not make sense at this location.	2/17/2017	email; Boulder County & CHAMP	Information was passed on to CHAMP for their consideration	The 500yr floodplain will be edited in this area (MSVC_11 Cross section 24453.27) to more closely follow contours.
49	Web Map Comment	1/18/2017	3202 Riverside Dr.	Middle St. Vrain	The houses along this stretch of the creek were not impacted by the 2013 flood.	general response	Boulder County	Comment was made prior to posting of relevant draft mapping from CHAMP study; referencing current regulatory floodplain mapping.	No response provided
50	Web Map Comment	1/18/2017	3202 Riverside Dr.	Middle St. Vrain	The shape of the 500 yr. floodplain here does not make sense.	2/17/2017	phone; Boulder County	Staff discussed the 100-yr floodplain model and insurance questions with the resident; Although there is no mortgage on the house in question, it is recommended to still carry a flood insurance policy due to the predicted flood risk hazard	No response provided
51	Web Map Comment	1/18/2017	99 Riverside Dr.	Middle St. Vrain	The flood plain clips the corner of our house. The water in 2013 did not reach the house. Also, the mapping of the creek and floodway in this section appears to be off.	2/17/2017	phone; Boulder County	Staff discussed roles of BoCo & Longmont along with landowners working on mapping in this area; McLean is working with BCPOS on restoration in this area.	No response provided

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
52	Web Map Comment	1/18/2017	99 Riverside Dr.	Middle St. Vrain	The shape of our home on the map does not match. The water in 2013 did not reach the house as this portion of the lot sits much higher. It appears the map does not account for the elevation change.	2/3/2017	Boulder County	The basemaps available for use on the webmap platform do not incorporate county road or structure information, they simply serve as background imagery to help orient users to the map. We apologize for the inaccuracies.	No response provided
53	Jan 19 Public Meeting	1/19/2017	2585 Riverside	Middle St. Vrain	"As trees continue to die from the 2013 flood, some are falling into the river along Middle St. Vrain canyon from Raymond to Lyons. They could cause issues again when runoff occurs. I suggest a proactive removal of trees that could cause problems. Thank you."	4/10/2017	Boulder County	Thank you for this information and concern. The Boulder County flood recovery and emergency management teams appreciate having been made aware of these concerns and issues related to hazardous debris.	No response provided
54	Jan 19 Public Meeting	1/19/2017	99 Riverside	Middle St. Vrain	Incorrect shift, shape of structure, and position [of structure]	general response	Boulder County	Thank you for your input.	No response provided
55	Jan 19 Public Meeting	1/19/2017	2345 - 2349 Riverside Dr	Middle St. Vrain	Comment written on map: "Bank stabilization - See if data was included; will provide as-buil[t]s" [In reference to 2347, 2349, and 2345 Riverside Dr.]	3/28/2017	CHAMP	Response provided by CHAMP	Bank stabilization data was incorporated in this area.
56	Jan 19 Public Meeting	1/19/2017	Gebore (21692 Hwy 7), Pigg (99 Riverside)	Middle St. Vrain	Comments written on map, From left to right: - "Map site didn't have goood search - had difficulty finding properties" Disregard this set of comments (Landowner followed up with corrections to statements regarding 21692 Hwy 7): - "[Floodplain] should flow through here" - "Elevated area (flow too high)" - "same elevaation (approximate)" - "correct elevation" - "structure missing" (upstream of 21692 Hwy7) Additional comments regarding the visible structures on the basemap: - "both have missing structures" (near 99 Riverside Dr) - "[structure] does not exist" - "elevated (part); structures on elevated portion; shape of structure incorrect; missing structure"	general response	Boulder County	Thank you for your input.	No response provided
57	Web Map Comment	1/30/2017	2585 Riverside Drive	Middle St. Vrain	This point on the property is approximately 5 feet above the elevation of the rest of the property and should probably be excluded from the proposed floodway. The old floodway is very inaccurate.	2/17/2017 3/28/2017	phone; Boulder County, CHAMP	Staff discussed the property and related questions over the phone; There is no mortgage on the structure, so he is not worried about his mapping situation	This high ground was surrounded by flooding on either sides. The 100yr storm reaches an elevation of 7758.89 ft upstream of the area and 7757.82 ft downstream of the area. According to topo, the area of concern is at an elevation of about 7758 ft. This highground would be inundated by the surounding floodplain. There may be an opportunity for a elevation certificate once mapping is finalized.
58	Jan 19 Public Meeting	1/31/2017	99 Riveside Dr Lyons, CO 80540	Middle St. Vrain	Comments related to two parcels (119934407004 AND 119934410001): "1. The shape of the house on parcel 119934407004 does not match our home. The new 100 year flood plain map appears to clip a corner of the house, but this corner does not exist as the building is not shaped as shown. 2. Our garage building is not shown on parcel 119934407004. 3. The map does not appear to account for the elevation change where our home is located on parcel 119934407004. That particular section sets much higher than the surrounding land. 4. There is a phantom building mapped to parcel no. 119934410001. This building does not exist. 5. Numerous homes and outbuilding are not shown on the parcels across the creek from our land. 6. The centerline of the creek does not appear to align with the county maps."	2/3/2017 3/28/17	email; Boulder County, CHAMP	Explained parcel inaccuracies and that parcel, structure, and channel info will be shared with Assessor & GIS staff; will share these comments, highlighting the elevation information when sharing with state engineers	1. This is Boulder County's parcel database. 2. This is Boulder County's parcel database. 3. Topography for this study is based on 2014 Lidar data. Please provide further information on elevation of area in question. The address given does not appear in the 100yr floodplain according to the house's location in Boulder County's parcel database. Need exact location to verify. 4. This is Boulder County's parcel database. 5. This is Boulder County's parcel database. 6. Addressed by assessor and GIS staff

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
59	Web Map Comment	2/8/2017	3202 Riverside Dr.	Middle St. Vrain	It seems odd here that there is little change in the width of the floodway or floodplain given that there is a major drainage (Cave Creek) that feed into the St. Vrain at this location. A back of the [message clipped by webmap form]	general response	Boulder County	Thank you for your input.	No response provided
60	Web Map Comment	2/14/2017	437 Riverside Dr.	Middle St. Vrain	We have a newly built cabin on this lot, the location of which was approved by Boulder County. Unable to determine whether new structure is in 100 year floodplain from this. Shouldn't be.	4/10/2017	Boulder County	The revised draft mapping indicates that the structure on this property may be mapped into the 100-year flood risk zone. Please continue to follow this remapping effort to stay abreast of new information.	No response provided
61	Web Map Comment	2/17/2017	2375 Riverside Drive	Middle St. Vrain	[Five] is much higher than properties downstream. The map is incorrect showing 5 as in a 500 year floodplain while the properties downstream are lower. Also the Riverside road is lower than 2375 structure	3/28/2017	CHAMP	Response provided by CHAMP	According to the MSVC_11 model, the edge of the house is well within the 500yr floodplain at a depth of about 3 ft. Topography is based on 2014 Lidar data but if the house truly is at a higher elevation than what is shown, there may be an opportunity for a elevation certificate once mapping is finalized. The homes downstream are not within the 500yr floodplain because they are below the bridge and the property in question is above a bridge that causes a constricting of the 500yr floodplain and shifts the 500yr floodplain into the left overbank. Also, the downstream water surface elevations are different from those at the property in question.
62	Web Map Comment	2/20/2017	3202 Riverside Dr.	Middle St. Vrain	It makes no sense that the floodway passes directly through this house. The creek channel is deep and immediately west of the house.	4/10/2017	Boulder County	Thank you for your input. The 100-year predicted flood zone is expected to reach the area indicated by the CHAMP floodway and extend through the 100-year floodplain. Conditions in this area of the Middle St. Vrain experienced less than a 100-yr event during the September 2013 flood event.	No response provided
63	Phone	4/19/2017	0 Hwy 7	Middle St. Vrain	Recently bought property at this location (parcel #119932000002) and was calling to check on its status since he received a postcard about the PC hearing	4/19/2017	Boulder County, phone	Staff spoke with the gentleman who called on the phone and explained the floodplain mapping process	Comment to be shared with CHAMP in future review period
64	Phone	5/1/2017	468 Riverside Dr	Middle St. Vrain	Called to schedule an appointment to look at maps in person at the Transportation offices	5/1/2017	Boulder County, phone	Staff held a meeting with resident on May 5 at the Transportation offices to review maps.	Comment to be shared with CHAMP in future review period
65	Comment Form	2/22/2017	579 & 575 Switzerland Park Rd	North Boulder Creek	I was present during the flood that impacted Dream Canyon, near Switzerland Park Rd. North Boulder Creek, in our canyon, was contained with no danger to the structures. The only issue was a culvert bridge causing water to back up due to debris. The culvert has been replaced with a county approved bridge and that should eliminate the risk. Putting the properties into a 100 year flood plain designation seems unnecessary and costly to home owners.	3/6/2017, 3/30/17	email; Boulder County, CHAMP	Information passed on to CHAMP for consideration (description, no data was shared)	This study was a base study, which captures structures as blocks to the floodplain. No information on the culvert structures was received. The 100yr water surface elevation is approximately 7541ft at the upstream home and 7532ft at the downstream home. Because both homes are anticipated to have small depth of flooding during the 100 year event, there could be an opportunity for an elevation certificate to verify the elevation once mapping is finalized to apply for a LOMA.
66	Comment Form	2/28/2017	1200 Cold Springs Dr	North Boulder Creek	"After reviewing the proposed floodplain and flood way map for North Boulder Creek at this address the homeowner and myself question the 100-year and 500-year extents shown. During the 2013 flood the homeowner monitored and documented with photos the water levels. At no time did the homeowner or any of their neighbors experience North Boulder Creek going over the natural river banks. In fact, the water level stayed below the existing bridge on their property that goes over North Boulder Creek. So unless Boulder County or the State of Colorado is diverting water they are not informing us about, myself and the homeowner feel the proposed 100-year and 500-year water levels are grossly inaccurate."	3/6/2017, 3/30/17	email; Boulder County, CHAMP	Provided information on the actual flows of 2013 - less than 100-yr event; Later communications led to further discussion of mapping models with CHAMP and Boulder County engineers	According to the hydraulic model for North Boulder Creek and calculated flows in this area, the resulting water surface is approximately 7992ft, with the front of the home being approximately the same elevation. There could be an opportunity for an elevation certificate/LOMA to verify the property elevation once mapping is finalized.

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
67	Comment Form	3/2/2017	1536 Cold Springs Dr	North Boulder Creek	"This map is not accurate for my property. It shows my house in the 100-yr floodplain and I question where the data for this came from. In the past, I have contracted the study of my property and house location to make sure the house is not in the 100-yr floodplain. Cross sections were surveyed and a hydraulic model (HEC-RAS) was developed for my property by a Professional Engineer. This clearly showed my house location outside of the 100-yr floodplain. I will not accept this draft if it is not based on actual survey data and a hydraulic model that is detailed enough to show isolated elevated locations on my property."	3/3/2017, 3/30/17	phone and email; Boulder County, CHAMP	Explained that the county would like to see any data that he has on his property to review it and have CHAMP consider it for the draft mapping; Spoke on the phone on 3/3 and landowner sent files of his survey data for our review; Communications continue.	The 100yr water surface elevation at the property in question is approximately 7937.5 ft. This is about 2 ft above the ground surface. If survey data is available, there could be an opportunity for an elevation certificate and LOMA to verify the elevation once mapping is finalized.
68	Direct Email	3/16/2017	1536 Cold Springs Dr	North Boulder Creek	Continued commucations regarding the LiDAR and modeling created for North Boulder Creek	3/20/17; 4/6/17; 4/27/17; 5/1/17; 5/5/2017	Boulder County and CHAMP, email and phone	Boulder County has scheduled a conference call for May 10 with resident and members of the CHAMP team to work toward an understanding on the map and model development.	Conference call with resident, CHAMP, and Boulder County scheduled for May 10th
69	Phone	3/21/2017	1704 Old Townsite	North Boulder Creek	Called with questions about the draft floodplain mapping and requested copies of the mapping.	3/22/2017	Boulder County, phone and email	Discussed the mapping process and staff offered to arrange an in-person meeting at the BoCo office to talk about the mapping in more detail if the resident would like to do so	Comment to be shared with CHAMP in future review period
70	Phone	3/22/2017	not provided	North Boulder Creek	Called after receiving postcard invitation to speak with staff at the BoCo office about the draft remapping along North Boulder Creek; Resident requested a meeting for the following day	3/22/2017	Boulder County, phone	Staff returned call and suggested a few reserved times later in the week and the following week during which staff would be available to meet with the resident.	Comment to be shared with CHAMP in future review period
71	Dec 13 Public Meeting	12/13/2016	63 Longmont Dam Rd., Lyons CO 80540	North St. Vrain	Would like to see the elevations used for the flood study at property - several feet of fill has been placed.	4/10/2017	Boulder County, CHAMP	Cross section information was sent to resident. These cross sections and the related modeling & mapping are subject to change until FEMA officially adopts new mapping for this area. This is anticipated in early 2019, but this timeline is also subject to change.	Will send screen shots of cross sections (XS 28735 - 28492)
72	Dec 13 Public Meeting	12/13/2016	1052 Apple Valley Road	North St. Vrain	Wants to see the old flow/recurrence interval rates for the North/South St. Vrain Creeks	4/10/2017	Boulder County	Email was sent with an attachment - Final St Vrain Hydrology Report (2014) - and an explanation of previous discharge rates for North & South St. Vrain Creeks	No response provided
73	Dec 13 Public Meeting	12/13/2016	2136 Apple Valley Rd	North St. Vrain	Comment written on map: "No flood in this area"	1/5/2017	CHAMP	Response provided by CHAMP	Model indicates that 500 year will reach this area and area is fairly flat
74	Dec 13 Public Meeting	12/13/2016	1908 Apple Valley Rd	North St. Vrain	Comments written on map: "This is old 100-yr floodplain"; [drawn line on map] "flood channel 3' deep, 30' wide"	1/5/2017	CHAMP	Response provided by CHAMP	Model indicates that 500 year will reach this area and area is fairly flat.
75	Dec 13 Public Meeting	12/13/2016	1416 Apple Valley Rd	North St. Vrain	Comment written on map: "opportunity here for river sinuosity in this broad, unoccupied land area - that would change the mapping..."	1/5/2017	CHAMP	No contact info provided	Need additional information on what is needed here.
76	Dec 13 Public Meeting	12/13/2016	1636 Apple Valley Rd	North St. Vrain	Comment written on map: "New home construction - please confirm is not in 100 + 500 yr floodplain"	1/5/2017	CHAMP	Response provided by CHAMP	Location does not seem to be in draft floodplain based on location drawn.
77	Dec 13 Public Meeting	12/13/2016	Hwy 36 / N St Vrain Dr	North St. Vrain	Comment written on map: "Plans to prevent road flooding?" (comment directed at 500-yr floodplain spilling onto Hwy 36)	1/5/2017	CHAMP	Response provided by CHAMP	Question was regarding plans to alleviate flooding that started after finished road construction. Meeting discussion was that his project was not addressing flooding issues, just identifying risk
78	Dec 13 Public Meeting	12/13/2016	18668 N St. Vrain Dr (River Community Church)	North St. Vrain	Comment written on map: "The dirt berm will not hold. It is all sand. Consider revision. The church will flood again!!"	1/5/2017	CHAMP	Thank you for your input.	Will be addressing with floodplain mapping per other comments.
79	Dec 13 Public Meeting	12/13/2016	1782 Apple Valley Rd	North St. Vrain	Comment written on map: [new home at location]	1/5/2017	CHAMP	Response provided by CHAMP	Can only determine approximate location near Apple Valley Road intersection with Apple Ridge Road. Intersection is not included in draft floodplain mapping.
80	Dec 13 Public Meeting	12/13/2016	not in floodplain	North St. Vrain	Comment written on map: "Subcritical flow / supercritical flow"	n/a		Response provided by CHAMP	No response provided
81	Dec 13 Public Meeting	12/13/2016	1 Blue Mountain Rd	North St. Vrain	Comment written on map: "prevent road flood?"	n/a		Response provided by CHAMP	No response provided
82	Dec 13 Public Meeting	12/13/2016		North St. Vrain	Comment written on map: "Why are there tiny 500-year islands in the 100-year?"	1/5/2017	CHAMP	Response provided by CHAMP	Small islands were removed as part of the floodplain cleanup process.

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
83	Dec 13 Public Meeting	12/13/2016	19680 N St Vrain Dr	North St. Vrain	Comment written on map: "This home had water enter crawlspace in 2013 '500 year' event. How can it now be w[e]ll within the 100 year floodplain?"	1/5/2017	CHAMP	Response provided by CHAMP	Do not have confirmation of 2013 event recurrence interval at this location. However, depth of flow for 100 year is very shallow at the house and deeper in adjacent areas. There could be an opportunity for an elevation certificate to verify the elevation once mapping is finalized.
84	Comment Form	1/5/2017	19680 N St Vrain Dr	North St. Vrain	I believe I commented once before; but, you have me freaked out. I am the property just upstream from the bridge over the north saint vrain. I'm very surprised by the draft map. The home on this 25 acre property didn't even get the carpet wet on a 500 year event; and, now this draft map has the house on the edge of the "floodway". Sure makes me question the modeling because this property should be extremely easy. The property is directly west of a bridge with a specific opening. If 500 year flows got through that opening and didn't get house wet, how in the world can house now be in floodway???? Even a 100 year flood wouldn't touch it. If that's the draft of the first property west of the bridge, it sure calls into question the modeling for all of Apple Valley on the North St Vrain.	1/9/2017	email; Boulder County	After reviewing the draft models for this area, Boulder County staff and consultants had some questions about CHAMP's results and asked that CHAMP revisit their approach for this area. We appreciate your input that shows support for the question we presented to them. Those recommendations have been received by CHAMP and it is in their hands to evaluate the model results for this area and determine the best approach.	No response provided
85	Jan 19 Public Meeting	1/19/2017		North St. Vrain	Comment written on map: "Missing 3 bldgs - Trigg (1 DU, 2 Acc. St. [accessory strucures] - White; noted by adj. property)"	n/a		No contact info provided	No response provided
86	Web Map Comment	1/31/2017	1034 Apple Valley Road	North St. Vrain	we do not think that our barn is in the Flood Way, maybe the 500 year flood plain. We have had an elevation certificate done, which we have sent to Peter Reinhart befroe Christmas. Sent when done 2014	4/10/2017	Boulder County	Thank you for mentioning this elevation certificate; County staff received this information.	No response provided
87	Web Map Comment	1/31/2017	1034 Apple Valley Road	North St. Vrain	same elevation as house. This needs to be re-assesed	n/a		No response provided	No response provided
88	Phone	3/24/2017	not provided	Not Recorded	Left a voicemail asking whether she still is required to pay for flood insurance if the draft maps show her property being mapped out.	3/24/2017	Boulder County, phone	Staff called resident back and explained that the mapping changes happening now do not yet impact flood insurance and effective FEMA mapping which dictates the insurance. Regardless, Boulder County encourages homeowners to hold flood insurance policies even if mapped out of floodplain.	Comment to be shared with CHAMP in future review period
89	Direct Email	4/13/2017	not provided	Not Recorded	Received post card RE Boulder Planning Commission public hearing about on 4/19 about updates on flood hazard mapping ad recommendations to adopt zoning code amendments. Tried to look up the Staff Recommendation and agenda as noted on the card. DE 170001 Can't be found. Please email same and additional project info to [resident].	4/13/2017	Boulder County, email	Replied with links to the project page and the public hearing information on the Boulder County website.	Comment to be shared with CHAMP in future review period
90	Jan 31 Public Meeting	1/31/2017		South Boulder Creek	9186, 8665, 8195; Interested in building home on property and would like print outs/pdfs of the cross section profiles (numbers above) in HEC-RAS models. Also looking for the county's responses to comments made at the summer code review meetings.	3/8/2017	email; Boulder County, CHAMP	Landowner was sent screen shots of cross sections 9186, 8665, and 8195 2016 code changes are available at http://www.bouldercounty.org/doc/landuse/dc150004bocc20160928.pdf	No response provided
91	Jan 31 Public Meeting	1/31/2017	4578 Prado Dr, Boulder	South Boulder Creek	Wondering when map from Eldorado Springs to 93 will be ready. Thanks! Also, who can I contact about Gross Reservoir Expansion? Thanks!	2/17/2017	email; Boulder County	Staff emailed with information about the rest of the South Boulder Creek draft maps	No response provided
92	Web Map Comment	2/15/2017	1173 Kneale Rd	South Boulder Creek	This property was not impacted by the flood of 1938 and 2013. Did not reach the house or any building.	general response	Boulder County	Thank you for your input.	No response provided
93	Web Map Comment	2/23/2017	860 Eldorado Avenue	South Boulder Creek	I survived the Sept 2014 floods without any problem in my cabin which is several feet above the spur creek on my property. I had flood insurance an cancelled it.	4/10/2017	Boulder County	The September 2013 flood event only reached approximately a 25-year chance event in this area, far less than a 100-year event. We encourage all residents to carry flood insurance as a protective measure even if you are not required to do so by your mortgage lender.	No response provided

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
94	Direct Email	3/23/2017	635 Bryan Ave	South Boulder Creek	"...I own lots 1-7 and 13-26 on the attached survey. My property address is 635 Bryan. You can see from the survey and it is easily seen in the field that the area indicated in the powerpoint is well above the flood level and does not flood. I am a landscape architect and have worked on more than 25 different rivers and have done a lot with H+H engineers. I have had the property since 1990 and there was a year 5-7 years ago where the water levels did approach the levels shown on your map which other than my suggested correction, appears quite accurate. ..."	3/29/2017	Boulder County, email	Thank you very much for your submittal. This is valuable input and I will pass your comments, the drawing, and the survey map along to the state engineering team for consideration in our next round of review.	Comment to be shared with CHAMP in future review period
95	Direct Email	4/24/2017	850 Kneale Rd	South Boulder Creek	"I received a card notifying me of a public meeting discussing "mapping updates" that may affect my property. I did not receive this notice until after the meeting date. Not receiving notice of a public meeting that affects my property does not sit well with me. I'd like to hear from you to learn how I can find out what is going on, and what Boulder County's plans are for my property."	5/5/2017	Boulder County, email	Staff sent a screen shot of the map at this property and encouraged resident to access more information about the Floodplain Remapping Project on the county website and also to access the maps themselves for futher review. Resident was also emailed the May 16th date of the BOCC hearing.	Comment to be shared with CHAMP in future review period
96	Dec 13 Public Meeting	12/13/2016	103 Co Rd. 69	South St. Vrain	Wants a copy of the maps at her property (South St. Vrain reach)	n/a	Boulder County	No contact info provided	No response provided
97	Direct Email	12/19/2016	83 County Road 69, Lyons	South St. Vrain	Detailed designs for the County Open Space Department SSV1 and SSV2 from NRCS are being prepared for work upstream of the Old South Road Bridge for construction in late summer.	1/5/2017	CHAMP	Response provided by CHAMP	Provide models for use in design plans.
98	Direct Email	12/19/2016	83 County Road 69, Lyons	South St. Vrain	Detailed designs for the SSV3 area adjacent to our properties are being completed by Town of Lyons with EWP staff for construction this spring.	1/5/2017	CHAMP	Response provided by CHAMP	Town of Lyons has access to models for planning purposes.
99	Jan 19 Public Meeting	1/19/2017		South St. Vrain	[drawing on map provided to indicate location of River Creek]	n/a		No contact info provided	No response provided
100	Web Map Comment	1/23/2017	21692 Hwy. 7	South St. Vrain	1/19 I had the map marked as potentially incorrect. Looking over my property afterwards, I think the mapping is in fact accurate. Same for the other side.You can disregard my meet mapnote.THX	general response	Boulder County	Thank you for your input.	No response provided
101	Web Map Comment	1/25/2017	21672 S St Vrain Dr Lyons, CO 80540	South St. Vrain	The 100 yr floodplain clips the corner of the house. Does this include the deck? No water went into house in 2013 flood.	3/28/2017	CHAMP	Response provided by CHAMP	According to arial imagery, the 100yr floodplain does include the deck. Looking at surrounding cross sections, shallow flooding (less than 2 ft) occurs in the left overbank. There could be an opportunity for an elevation certificate to verify the elevation once mapping is finalized.
102	Dec 13 Public Meeting	12/13/2016	PO Box 695, Lyons CO 80540	St. Vrain (RiskMAP)	Requested access to shapefiles for draft data in order for Lyons FPD to incorporate it into their GIS sytem.	12/21/2016	Email; Boulder County	The county is not able to provide this data directly due to its draft nature, but can direct Lyons FPD to a website on which we are publishing the draft data as it becomes available and is reviewed by our internal team of engineers. That website is http://arcg.is/2fF4CZY. Once these draft maps are locally adopted by Boulder County, the county may be able to distribute this data to Lyons FPD.	No response provided
103	Dec 13 Public Meeting	12/13/2016		St. Vrain (RiskMAP)	Anonymous comment written on map: "- describe the time difference between draft & regulatory - explain the 500-yr layer that looks orange in blue 100-yr layer" *(split flow region on St. Vrain)*	n/a		No contact info provided	No response provided
104	Dec 13 Public Meeting	12/13/2016	69 Hover, Longmont	St. Vrain (RiskMAP)	Curious if as-builts were incorporated into draft map data - specifically for ditch diversion structures at Rough & Ready, Oligarchy ditches	1/5/2017	Boulder County, CHAMP	Boulder County staff have been in contact with landowner and contractor and explained that the data is currently being compiled for incorporation and that analyses do not expect the as-built data to impact the floodplain composition. Ongoing communications.	Small structures may not impact the floodplain but if asbuilts are available we can determine impacts.

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
105	Web Map Comment	12/20/2016	12996 North Foothills Hwy	St. Vrain (RiskMAP)	House is at same elevation, first issue the south property boundary is 50 feet too far south on this map, surveys showing the difference, the floodway draft goes through the center of the house, yet the house is the same elevation	3/28/2017	CHAMP	Response provided by CHAMP	House appears in the floodway due to its close proximity to the streamline (130ft). Survey should be provided to show difference. There is shallow flooding at house and it is deeper in adjacent areas. There could be an opportunity for an elevation certificate to verify the elevation once mapping is finalized.
106	Comment Form	12/20/2016	12996 North Foothills Hwy	St. Vrain (RiskMAP)	What is the flood determination of this property-floodway, 100 year, 500 year? I checked the maps but see different definitions between FEMA and the county… What land use limitations might this property have as a result? I am looking into the possibilities/limitations of a change of use of this property from rural residential to use for a private micro-school, (institutional use?). Any information you can provide regarding this inquiry is much appreciated. Thanks.	1/10/2017	email; Boulder County	The property at 12996 N Foothills Hwy currently has floodway and 100-yr floodplain as regulated zones and there is the potential for some of the property to be mapped out of the 100-yr into the 500-yr floodplain. Each of these zones has different regulations as it pertains to development, and there are restrictions in the code in regard to schools and critical facilities that are more stringent than for residential use. Staff sent a link and references to the Land Use Code as well.	No response provided
107	Comment Form	1/6/2017	13050 N Foothills Hwy	St. Vrain (RiskMAP)	Being in the flood way. can a person build, repair any other repairs that need to done? Such as septic roofing and any other maintance that requires a building permit? We just had the 13050 and the 4592 Ute Hwy appraised as two of our sons would like to buy. Does the floodway make the places less valuable? The 13050 is all in the floodway. The house there was built in 1939 and with stood many floods,. The 4592 house is just out, but the shop which didn"t get any water in it, also a small building are in the flood plain. Also on the 13050 place there was a sawmill just east of the and it was okay.	1/31/2017	email; Boulder County	Repairs & Maintenance on structures in the floodway: Septic systems cannot be expanded unless expanding them is required to bring them into compliance with code regulations and no new septic systems can be installed. Roofing is not limited as long as you are re-roofing an existing structure similar to what it was before. Home value: Floodplain and floodway mapping does not necessarily mean that the home value will change. So many factors go into that assessment that I recommend talking to the County Assessor's office if you want to learn more specifics about your property and trends in your area. Often, the home values have gone up in flood damaged areas even with new flood risk simply because there is a high demand for property in the Colorado Front Range. You can contact the County Assessor's office at 303-441-3530.	No response provided
108	Comment Form	1/9/2017	4800 Ute Hwy	St. Vrain (RiskMAP)	My concern is why my property is categorized in the 1% Annual Chance Flood Hazard ? When the flood of 2013 happened there was no water damage to the office, tuff sheds, vehicles or the two cabins that are on the property.	1/9/2017	email; Boulder County	Thank you for your inquiry. The maps indicate that your property is currently partially within the floodway as well as the 100-yr floodplain and will potentially be mapped further out of the floodway and into the 100-yr floodplain. This is a potential improvement and is a result of robust hydraulic modeling calculations that take a considerable number of factors into account both upstream and downstream of your location. These are not meant to be representations of what was inundated in a specific flood event, but rather a prediction of future flood risk. The term "100-year" refers to the 1% chance in any given year that this area will suffer from a flood hazard and the improved data in our floodplain models show how this risk has moved since the last time maps were developed.	No response provided
109	Comment Form	3/6/2017	12996 N Foothills Hwy	St. Vrain (RiskMAP)	Working with landowners to sell property and had questions regarding property lines as well and floodplain zones and their impact on development options (floodway vs. flood fringe, where additions or additional development may be possible based on new mapping)	3/7/2017, 3/30/17	voicemail and email; Boulder County, CHAMP	explained new mapping to help guide her discussion with the property owners, referenced Land Use code for FO District, and referred her to the Assessor's Office for parcel line questions	The structure that is located to the west of the property is in the floodway. The approximate water surface elevation at this structure is 5266ft. This is higher than the top of the bottom floor elevation (5262.5ft) given in the elevation certificate.

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
110	Phone	4/18/2017	13050 N Foothills / 4592 Ute Hwy	St. Vrain (RiskMAP)	Looking for assitance in rebuilding her home in the floodway. Called with a question about assistance offered by the FRPIC but unable to provide details on the specific assistance advertised.	5/3/2017	Boulder County, phone	Resident is looking for answers as to why she cannot rebuild her residence that washed away where there is now a proposed regulatory floodway. Staff tried to explain the risk of structure hazards when located in a floodway to the property owner as well as people and properties upstream and downstream of the hazard. Staff also tried to offer the assistance of the Land Use department and looking at specific code details related to floodway development. Resident refused this offer. Call ended when resident hung up while staff was offering further assistance.	Comment to be shared with CHAMP in future review period
111	Dec 13 Public Meeting	12/13/2016	69 Hover, Longmont	St. Vrain (RSV)	Who (Bouder County/ City of Longmont/ someone else) is responsible for area from eastern edge of RiskMAP area to Longmont western boudary? There are ponds in this area that might be getting filled and he is concerned that this will cause a major conveyance issue.	Ongoing communications	Boulder County, CHAMP, and City of Longmont	Boulder County staff worked with resident to understand the concerns in the area and to deliver previous study data to CHAMP team for review. From there, further conversations have resulted in coordination between the CHAMP team and City of Longmont staff.	No response provided
112	Web Map Comment	12/13/2016	7899 St. Vrain Road, Longmont CO 80503	St. Vrain (RSV)	"Updated mapping shows our home in the floodway. Please review the basis for this and contact me with updated information."	1/5/2017	Boulder County, CHAMP	Ongoing communications between Boulder County and resident	House appears in the floodplain due to relatively low elevation (5052 ft.). This results in a depth of at least 1 ft. for the 100yr storm. There is shallow flooding at house and it is deeper in adjacent areas. Was able to move home out of the floodway.
113	Jan 10 Public Meeting	1/10/2017	9356 Rogers Rd, Longmont 80503	St. Vrain (RSV)	Has an FDP with an Elevation Certificate. The draft maps show him coming out of the floodway; does he still need to meet BFE?	4/10/2017	Boulder County	Development decisions are based on current regulatory mapping and best available data. A Land Use referral will be helpful in determining your best path forward.	Should work with local floodplain administrator to determine appropriate action.
114	Web Map Comment	1/25/2017	600 S. Airport Rd, Suite A-205	St. Vrain (RSV)	Final floodplain mapping should consider repairs to Lake 3, Lake 4, West Lake and A-Frame lake. Final mapping should not be based on existing floodplain land surface contours, but post-repair cond.	3/28/2017	CHAMP	Response provided by CHAMP	Topography for this study is based on 2014 Lidar data. Additional survey or topographic information should be submitted if construction was completed in the floodplain.
115	Web Map Comment	1/26/2017	69 Hover Rd., Longmont	St. Vrain (RSV)	The centerline of flow (blue line) at this bifurcated crossing at Hover Rd, should be located about 500 ft farther south. This more southerly location reflects: 1) actual "Low" ground in thi	3/28/2017	CHAMP	regular communications	This reach of the Saint Vrain Creek was modeled by CH2M HILL as part of a CLOMR for the Town of Longmont. This model was adopted as part of this restudy effort to keep mapping as current as possible. Coordination should be made with CH2M Hill and the Town of Longmont.
116	Web Map Comment	1/26/2017	69 Hover, Longmont	St. Vrain (RSV)	Blue line to be located here: Actual centerline of Hover St. 2013 overtopping, Historic river location, actual low ground, see additional comments, pictures on file w AECOM.	2/17/2017	voicemail and email; Boulder County	regular communications	This reach of the Saint Vrain Creek was modeled by CH2M HILL as part of a CLOMR for the Town of Longmont. This model was adopted as part of this restudy effort to keep mapping as current as possible. Coordination should be made with CH2M Hill and the Town of Longmont.
117	Web Map Comment	2/21/2017	9639 North 89th St Longmont, CO	St. Vrain (RSV)	When will new maps for Dry Creek, South of Greg Rd be available? The city of Longmont is changing the flood plain (map) to accomodate new annexation of property. How does this affect county?	4/10/2017	Boulder County	The county will not be managing map revisions for this area - please contact the City of Longmont with further questions.	No response provided
118	Phone	4/19/2017	6354 Hygeine Rd	St. Vrain (RSV)	Approximately 8-10 feet of the corner of his property are shown to be in the floodway with the revised mapping; He is asking that it be removed. He also expressed concern about nearby culverts that may not be sized appropriately.	4/19/2017	Boulder County, phone	Staff spoke with resident and let him know that his concerns will be recorded and shared with the remapping team.	Comment to be shared with CHAMP in future review period
119	Phone	4/28/2017	Cemex properties	St. Vrain (RSV)	Called on 4/28 to set up a meeting with Varda & Erin to discuss development options in area of Cemex property that is partially in floodplain; Would like to know what options they have related to ripping out berms and replacing them with guard rails (near a railroad as well)	5/4/2017	Boulder County, phone	Staff spoke with [property manager/consultant] and scheduled a meeting at the TD offices to discuss further.	Comment to be shared with CHAMP in future review period

Count	Comment Source	Comment Date	Address/Location Referenced	Associated River Reach	Comment	Date of Response	Respondent / Method of Communication	Boulder County Response	CHAMP Response
120	Direct Email	1/28/2017	225 Linden Dr	Twomile Canyon Creek	I called Kurt Bauer a while back and he told me to get in touch with Varda Blum, regarding floodplain mapping. Got a card from the County that says you are in charge of this - is that correct? The reason I want my flood risk classification looked at, is that my property did not suffer any damage during the Sep 2013 flood. But I am rated as being in the 100-year floodplain and paying the elevated rate. My property (address below; AKA "Spring Valley Estates, Lot 35") was shown to have flood risk on its NW corner. That was not the case. I will goto the website you publicized and try to enter comments there also.	1/30/2017	email; Boulder County	Staff are in ongoing discussions about the mapping in this area. Staff encouraged resident to attend the 1/31 public meeting where several project engineers can talk about what is proposed at the property.	No response provided
121	Jan 31 Public Meeting	1/31/2017	1903 Linden Dr., Boulder CO 80304	Twomile Canyon Creek	Culvert dimensions/info at TMC_06 below dam are correct; however, prior engineering study showed the culvert having a capacity between 350 to 400 cfs. CHAMP model shows culvert overtoppingg between 4% (@ 222 cfs) and 2% (@285 cfs) intervals. Witnessed maximum flow during flood and didn't overtop culvert. Reservoir filled to 1 to 2 ft below top and continued spilling for a long time. Does have discharge-stage curve for dam, can use to estimate flow capacity for culvert.	2/6/2017, 3/28/17	email; Boulder County, CHAMP	Communication via multiple emails with resident and CHAMP; determined that experienced flow may have been less than predicted and that culvert capacity may not be accurate based on resident's data (CHAMP data showed capacity to be lower).	Floodplain is being reevaluated in the area based on communication between AECOM and the community. Updated terrain in the area was provided by the community and the floodplain will be edited accordingly.
122	Phone	4/15/2017	219 High View, Pine Brook Hills	Twomile Canyon Creek	Question about the implications of floodplain mapping	4/19/2017	Boulder County, phone	Staff called resident back and explained floodplain mapping and the mapping process; Resident appreciated learning more about the process	Comment to be shared with CHAMP in future review period
123	Direct Email	4/28/2017	1903 Linden Dr.	Twomile Canyon Creek	Continued communications regarding the culvert and dam structures located at the Pinebrook Water District facilities; sharing of more data and throughts on data sources and accuracy	5/1/2017	Boulder County, email	Boulder County consultant responded after further analysis and determined previous data discussed (on 1/31, 2/6 and 3/28) with resident remained accurate according to consultant's analysis.	Comment to be shared with CHAMP in future review period