



FACT SHEET/STUDY MEMO

<i>Project Name:</i>	Colorado Hazard Mapping Program – Phase I		
<i>Regarding:</i>	Coordination of Project Scope	<i>Date:</i>	August 13, 2015
<i>Community</i>	City of Boulder in Boulder County		
<i>Community Contact(s)</i>	Jessica Stevens, Civil Engineer II: stevensj@bouldercolorado.gov , 303-441-3121 Jane Brautigam, City Manager: brautigamj@bouldercolorado.gov , 303-441-3090		
<i>Project Contacts:</i>	Thuy Patton, CWCB Floodplain Mapping Coordinator: thuy.patton@state.co.us , 303-866-3441 x3230 Remmet deGroot, AECOM Program Manager: remmet.degroot@aecom.com , 303-796-4633		

This memo documents the Colorado Water Conservation Board (CWCB) is coordinating with the appropriate community contacts regarding the scope and methodology of the Colorado Hazard Mapping Program (Project). The Project will take multiple years to complete, so it is important to have a record of this coordination. This memo serves to show the communities have reviewed and agree with the study methodology by signing at the bottom, and is for documentation purposes only. A summary of the Project is described below.

Project Objective

The Project involves conducting new flood hazard analyses and special flood hazard area delineations for streams particularly affected by the September 2013 flood event in the St. Vrain and Big Thompson HUC-8 watersheds (IDs 10190005 and 10190006, respectively). The resulting products and deliverables are expected to form the basis for a subsequent regulatory update for all studied streams under the Federal Emergency Management Agency's (FEMA's) Risk Mapping, Assessment, and Planning (MAP) Program. This regulatory update is not scoped or funded at this time. Throughout this process, CWCB and their consultant, AECOM, plan to coordinate with Federal, State, and local government entities as well as other relevant stakeholders to collaborate on project efforts, increase flood awareness, and assist in identifying risk mitigation actions.

General Project Approach

The following methodology will be applied to studying the selected streams in the St. Vrain and Big Thompson watersheds, except where deviations are specifically noted in the community-specific section below. All studies will be conducted using FEMA's applicable Guidelines and Standards for Flood Hazard Mapping. Project activities, including field surveys, will commence in the summer of 2015, except for reaches that will be studied starting in the fall of 2016 due to ongoing construction and recovery efforts.

The project tasks vary based on the study level of each stream. The scoped streams and their study levels are shown on the enclosed Scoping Map. Enhanced Level studies include survey and field reconnaissance and will eventually result in special flood hazard area delineations with plotted base flood elevations and regulatory floodways. Base Level studies do not incorporate field reconnaissance or survey data, rely exclusively on topographic data for terrain information, and will eventually result in model-backed special flood hazard areas without plotted base flood elevations. The Project tasks generally include the following sequence:

- Field Survey and Reconnaissance – Task will include the following for enhanced reaches (base level studied reaches are not surveyed):
 - Documenting the condition and types of hydraulic structures, such as bridges and culverts, and estimating associated parameters to include Manning coefficients
 - Surveying structure dimensions and adjacent cross sections
 - Surveying the channel and special flood hazard areas along cross sections spaced approximately 2,000 to 3,000 feet apart in the plains and mountains, respectively, where structure spacing allows
- Topographic Data – Task will include generating terrain models using topographic data from:
 - USACE 2014 LiDAR where available, collected in October 2014
 - USGS 2013 LiDAR elsewhere, collected from October 2013 through January 2014
- Hydrology – Task will include:
 - Using CDOT post flood hydrologic analyses where available and modifying it to include the “1% plus” and 4% flow rates per FEMA specifications
 - Calculating new peak flood flows for the 10%, 4%, 2%, 1%, “1% plus” and 0.2% annual chance events for streams not included in the CDOT post-flood hydrology analyses



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- **Hydraulics** – Task will include performing 1-dimensional, steady-state HEC-RAS hydraulic analyses for all identified streams.
- **Flood Hazard Mapping** – Task will include producing special flood hazard area delineations for each level of study. While this phase of the project does not include a regulatory update, the work will tie into FEMA's National Flood Hazard Layer (NFHL) as appropriate and the analysis will be in accordance with FEMA's specifications and quality procedures. The following special flood hazard areas are mapped based on study level:
 - **Enhanced Level** – 1% and 0.2% annual chance flood hazard areas and regulatory floodway boundaries calculated with a ½ foot rise with profiles and floodway data tables
 - **Base Level** – 1%-annual-chance flood hazard areas
- **Outreach** – Due to the large area covered, project duration, and numerous stakeholders involved, routine communication is critical to this project. CWCBC announced the project scope and objective to community stakeholders by email on May 28, 2015 and held a project kickoff meeting at CDOT's facility in Loveland on July 9, 2015. Community and county-specific discussions have been taking place as described in the section below. If additional or alternate contacts should be included in future discussions, please notify the project contacts listed above.

Quarterly progress meetings will be held in Loveland starting in October, project information will be disseminated via newsletters and the project website (www.coloradohazardmapping.com), and flood risk review meetings will occur as necessary when results have been generated. Outreach is directed toward community officials, so they can disseminate appropriate information to the general public as necessary. Accompanying this memo is a brief flyer describing the scope and intent of this Project that can be shared with the public.

Community Specific Studied Streams and Decision Documentation

Streams were initially selected for study based on areas particularly affected by 2013 flood events. The table below summarizes additional conversations that were held and led to revision and/or confirmation of scope pertinent to Boulder.

Date	Correspondence Type	Stakeholder	Comments Provided
May 28, June 9-10, July 17 and 21, 2015	Emails	Boulder County & UDFCD	• Prefers that surveyors send written documentation to property owners prior to survey effort. • UDFCD requested that future conditions hydrology be considered for segments crossing their boundary. Upstream reaches will also utilize future conditions, while downstream reaches utilize existing conditions. Tie ins with future conditions hydrology across UDFCD will be handled on a case-by-case basis and communicated appropriately. Hydrology will be available from UDFCD.
June 16, 2015	Email and transmitted scoped streams CAD files		• Indicated that studies initially identified within UDFCD boundary did not need to be studied per email correspondence. Those listed in this memo were the only ones that were added.
July 9, 2015	Kickoff Meeting		• Requested Dry Creek #2 be studied downstream of UDFCD's boundary.
August 12, 2015	Phone Calls		• Portions of Fourmile Canyon Creek and Two Mile Creek upstream of the City of Boulder were requested for study with detailed portions inside UDFCD's boundary. • Indicated data from Michael Baker Jr. is available for Fourmile Canyon Creek.

The table below summarizes the streams scoped for study whose reaches are near or within the limits of Boulder.

Stream Name and Reach ID	Reach Description	Length (mi)	Level of Study	Topography Source	Hydrology Source*	Anticipated Start
Boulder Creek (SV-2a)	From confluence with St. Vrain Creek upstream to just downstream of Fourmile Canyon, Boulder Creek, and South Boulder Creek confluence	17.2	Enhanced	2014 USACE LiDAR	CDOT Phase II*	Summer 2015



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Stream Name and Reach ID	Reach Description	Length (mi)	Level of Study	Topography Source	Hydrology Source*	Anticipated Start
Fourmile Canyon Creek (SV-9a)	From UDFCD boundary downstream 1.7 miles	1.7	Enhanced	2013 USGS LiDAR	CDOT Phase II*	Summer 2015
Two Mile Creek (SV-19)	From City of Boulder community boundary upstream 1.2 miles	1.2	Enhanced	2013 USGS LiDAR	New*	Summer 2015
Dry Creek No.2 (SV-21)	From Confluence with St. Vrain Creek, upstream to UDFCD boundary	11.8	Enhanced	2013 USGS LiDAR	New	Summer 2015

*Denotes that stream segment assumes future conditions hydrology per UDFCD request. Stream segments located upstream of the UDFCD boundary will reflect future conditions hydrology for model continuity.

Request for Concurrence

Should you have any questions or comments regarding the stated scope of work, please contact Thuy Patton, CWCB Floodplain Mapping Coordinator (thuy.patton@state.co.us or 303-866-3441 x3230), or Remmet deGroot, AECOM Program Manager (remmet.degroot@aecom.com or 303-796-4633). Otherwise please indicate your concurrence with the above approach and project understanding by returning a scanned signed copy of this Fact Sheet/Study Memo to Ms. Patton or Mr. deGroot (only one community representative needs to sign). We request that you contact us or provide concurrence within 10 business days. We appreciate your timely response and look forward to working with you on this Project.

Edward Stafford
Printed Name

Dev Rev Mgr - PW
Title/Position

City of Boulder
Agency

[Signature]
Signature

9/24/15
Date

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