

July 12, 2016

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Submitted via email to: [CMui.svcc@gmail.com](mailto:CMui.svcc@gmail.com)

## Re: South St Vrain Creek Restoration at Hall Ranch - Alternative Analyses and Preferred Alternative

Dear Cecily Mui and Coalition;

This memorandum is to discuss the alternatives that have been developed as part of this South St. Vrain Creek Restoration at Hall Ranch along with steps to determine the preferred alternative. From our understanding there was some concern with our approach to developing the alternatives and then the process of developing a preferred alternative, therefore would like to clarify. This is a tried and true process that has been vetted through other coalitions and other projects throughout the state. We are confident in our approach and the ability to develop a safe, natural, resilient, functioning, and ecologically rich habitat along the South St. Vrain Creek corridor.

In summary, issue and reach based alternatives were developed based upon stakeholder's comments including homeowners, Coalition members, and Boulder County Parks and Open Space employees. In order to design a holistic, resilient project design some of these alternatives will be used in combination to address the issues of the corridor at various locations. Once the various alternative combinations have been developed, they will be evaluated and analyzed using a decision matrix along with sound engineering, science and geomorphological studies.

The information below will develop in more detail how the alternatives were determined and how a combination of alternatives will become the preferred alternative for various locations along the corridor.

### Alternatives

The alternatives developed as part of this project have been developed based upon multiple constraints and criteria. These constraints and criteria were developed into a Decision Making Process diagram that was presented at the June 30 public meeting and is also attached. This Decision Making Process diagram was developed based upon critical issues from stakeholder comments, which were developed into the Project Goals Statement, Core Values and Prioritization Criteria. The alternatives for this project will not only be evaluated for the Emergency Watershed Protection (EWP) eligible areas (SSV 1 and SSV 2), but **for the entire 3.2 mile reach**. Below is a list of some of the constraints and criteria used to determine the alternatives:

- Public comments
- Landowner meetings
- Known existing and proposed projects
- History of flooding
- St Vrain Creek Master Plan
- Costs
- Property ownership
- Natural channel design process
- Feasibility

Numerous visits with the landowners and members of the Coalition have taken place to develop the alternatives for this project, including one-on-one, on site meetings with landowners throughout the corridor. The design team has attended a Coalition supported working group meeting (May 11) along with two presentations to the Coalition (May 25 and June 29) and two presentations to the public (May 24 and June 30) with regard to this project.

Having two to three “alternatives” for the entire 3.2 mile reach would not meet the goals of this project, nor would it propose a resilient design that can be implemented. The fact that this project is composed of a 3.2 mile reach of the South St Vrain Creek from above the andesite quarry down to the eastern Old South St. Vrain Road Bridge leads to an issue and sub-reach based alternative development approach. Understanding that each sub-reach of the project has its own stream processes and constraints means that each will have its own alternative or combination of alternatives. Therefore, there is the potential for multiple alternatives for each sub-reach. Consequently each sub-reach was evaluated on its own and then the entire 3.2 miles will be holistically evaluated to determine the preferred alternative from a combination of alternatives.

Therefore, our team developed issue and reach based alternatives to address the specific concerns for various sub-reaches. The main issues facing the corridor are dis-connection of the floodplain from the channel, minimal instream structures for geomorphically effective bedforms and habit, lack of vegetation to support a diverse ecosystem, and risk of infrastructure to future flooding. The four alternatives developed to address each of the aforementioned issues are Floodplain Connectivity, Channel Complexity, Revegetation and Infrastructure Protection, respectively. Descriptions and illustration of these alternatives were provided at the Coalition and public meetings and can be supplied as requested.

These alternatives and the location of each alternative were presented at the public meeting on June 30<sup>th</sup> with a PowerPoint presentation to explain each alternative and the benefit of each alternative along with their location on aerial roll maps, which were available for the public to view. Meeting participants had an opportunity to ask questions and comment on each alternative and its location. These comments will be addressed to refine the alternatives prior to developing a preferred alternative.

While this is not a master planning process and is a 30% design, evaluation of existing infrastructure constraints will take place. But it must be understood that the purpose of this project is not to modify existing infrastructure, but to work within the corridor and provide a robust design that can be implemented based upon various sources of funding now and in the future. Planning elements will be added to the plan set to inform future designs of potential aspects that could be evaluated in more depth to provide an even more resilient and ecologically healthy ecosystem. It will be the option of the owners of the various infrastructures to further these designs as they feel appropriate.

### **Preferred Alternative**

The next steps the design team will take will be to use the Decision Matrix based upon the Decision Making Process diagram along with performing in depth hydraulic analyses on alternatives developed to determine which combination of alternatives at various locations throughout the corridor should be implemented. The Decision Matrix developed was presented at the public meeting on June 30<sup>th</sup> and was based upon the project goals statement and stakeholder comments and feedback. The Decision Matrix has been completed by the design team and is attached to this memorandum. This matrix will help lead the team in determining what was most important to the stakeholders.

The hydraulic analyses will include modeling of the entire corridor using HEC-RAS 1-D and Sedimentation and River Hydraulics (SRH) 2-D, along with a sediment transport analysis and geomorphological study. These analyses and studies will be developed based upon multiple recurrence interval flows from the bankfull discharge of the 1.5 year storm to the 100 year storm. The preferred alternative will be decided based upon sound engineering and science including stream power, water levels, velocity, shear stresses and geomorphological constraints. Existing and proposed projects will be included with this evaluation to ensure a holistic design throughout the corridor.

Once the preferred alternative throughout the corridor has been decided, then another in-depth site visit will take place with the stakeholders to walk them through the preferred alternative decision process and the preferred alternative.