



June 28<sup>th</sup>, 2019

To: Chris Sturm, Colorado Water Conservation Board (CWCB)

From: Lefthand Watershed Oversight Group (DBA Left Hand Watershed Center)

RE: CWCB Grant – St. Vrain Creek Coalition Monitoring & Outreach grant final report

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The purpose of this memo is to provide a final report about activities related to Left Hand Watershed Center (the Watershed Center)'s St. Vrain Creek Coalition Monitoring & Outreach grant (PO 2019-2561). This includes the status of the tasks identified in the statement of work and a description of any major issues that have occurred and any corrective action taken to address these issues.

The goal of this project is to assess the success of St. Vrain Creek Coalition's completed restoration projects in meeting their goals using an adaptive management approach. Given the short timeframe and budget associated with the project, the projects objectives in this phase were to:

- Complete annual site monitoring using qualitative assessment forms (photo monitoring, EWP monitoring form, LWOOG high flow monitoring).
- Complete necessary grant project management and reporting
- Complete outreach tasks inform the community about watershed related news, meetings and information.

## **1. Progress Towards Project Completion**

### **Task 1. Monitoring and Adaptive Management**

This spring and early summer 2019, we were able to complete qualitative monitoring activities necessary to conduct annual EWP inspections and reports (attachment 1) as well as high flow monitoring (observations [here](#)). High flow monitoring activities documented floodplain inundation at each restoration site during peak flows in the North St. Vrain and St. Vrain Creeks. These observations are important for evaluating restoration design and watershed function. During this time period, via separate funding source, we also updated our adaptive management plan to better define quantitative methods to assess each project's trajectory towards goals. As a result of this update, several low-flow data collection methods are recommended to more fully understand and evaluate project success and inform future management. Monitoring activities and assessment of warranty requirements this spring resulted in implementation of several follow up activities as summarized below.

#### *McConnell*

The contractor (Frontier) implemented warranty activities including installing additional container stock (D60 stock, left bank) and completing additional seeding in zones 3 and 4 before warranty period expired (April, 2019). In addition, SVCC/the Watershed Center utilized funds raised from private landowners to hire contractor to complete weed control activities this spring. 0.84 acres treated,

targeting nine target weed species. Warranty issues regarding container stock appear to be due to lack of watering. Tanks and irrigation were installed at this site but never utilized.

### *Apple Valley North*

Contractor WRV completed warranty activities including seeding zone 2 and 3, remediating (hand disturbing and re-seeding) bank overflow areas with 100% Kochia infestation. Note, areas with topsoil imported resulted in 100% Kochia infestation. Additional weed control and follow up seeding throughout the site is needed and recommended, however SVCC/Watershed Center currently has no additional funding is available for this purpose.

### *Apple Valley South*

Contractor Aloterra completed warranty activities including harvesting and planting over 600 willows with assistance for the Watershed Center, via a two Watershed Center volunteer events in April, 2019. In addition, the SVCC/the Watershed Center utilized funds raised from private landowners to hire a contractor to complete hand-control weed control activities this spring.

## **Task 2. Partners, Outreach, Project Management**

Under this task, Watershed Center staff attended partnership meetings, board meetings, and completed other outreach tasks on behalf of the St. Vrain Creek Coalition.

## **2. Obstacles Encountered and Solutions**

Below is a summary of obstacles encountered and solutions during this first phase of the project.

- Length of Contract – Due to the short nature of the contract, and on-going need for adaptive management & monitoring to ensure project success, additional time and funding is needed to adequately address basic operations and maintenance needs this summer/fall. This includes additional monitoring funding, seeding, weed control, and irrigation maintenance.
- Adaptive Management- Via a separate funding sources, the Watershed Center recently updated our adaptive management framework to streamline data collection and more efficiently assess progress toward goals. As discussed with the CWCB, we are interested in expanding this effort to St. Vrain projects to better inform restoration science and work toward increased collective understanding of watershed science.

## **3. Recommendations & Follow up**

As described above several follow up activities are recommended as a result of monitoring:

- Acquiring longer-term funding for continued adaptive management on project sites, and expansion of the Watershed Center's adaptive management tool into the St. Vrain.
- On a shorter timeframe, funding is needed this summer/fall to complete monitoring, weed control, seeding, and irrigation activities.

## **4. Confirmation of Matching Commitments**

Below we provide a confirmation of each source of matching funding for this project, including award amount and date.

| Funding Source                                      | Amount  | Date of Award    |
|---|---------|------------------|
| SVCC- Hiring Watershed Center Staff to oversee work | \$4,400 | November 1, 2018 |
| SVCC-Weed Control Contractor                        | \$5,000 | N/A (SVCC funds) |

## 5. Attachments

1. EWP Annual Inspections
  - a. Apple Valley North
  - b. Apple Valley South
  - c. McConnell
2. EWP Annual Inspection Slides
  - a. Apple Valley North
  - b. Apple Valley South
  - c. McConnell

## Memo – Annual Inspection Report

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**To:** Chris Sturm, CWCB

**From:** Saint Vrain Creek Coalition

**Date:** 6/27/2019

**RE:** Apple Valley North

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Per the requirements of the operations and maintenance plan for EWP projects, we have completed our annual inspection of Apple Valley North on Saint Vrain Creek. Below are responses to various questions regarding project status and condition. Included with this memorandum is the inspection report noting specific areas of concern and areas of success.

1. Is there any dense vegetation that may be reducing flood conveyance?
  - a. *No evidence of dense vegetation that may reduce flood conveyance. Willows line the banks, but do not constrict flow at high flow. Continued treatment of Kochia infestation in overflows is recommended to prevent encroachment.*
2. Is there any dense vegetation that may cause debris hazards either by dislodging or by trapping other debris?
  - a. *No evidence of dense vegetation that may cause a debris hazards.*
3. Is there any erosion that is threatening property, structures, or infrastructure?
  - a. *No evidence of erosion threatening property, structures or infrastructure.*
4. Have any of the instream structures adjusted and maintained the original design intent?
  - a. *No evidence of instream structures adjusting.*
5. Have any of the instream structures adjusted and not maintained the original design intent?
  - a. *No evidence of instream structures adjusting and not maintaining original design intent.*
6. Has the low flow channel adjusted laterally either through avulsion or through bank erosion or sedimentation?
  - a. *No evidence of low flow channel lateral adjustment.*
7. Has the bankfull channel adjusted laterally either through avulsion or through bank erosion or sedimentation?
  - a. *Sedimentation in the outflow of the overflow channel may cause bankfull widening. No cause for immediate concern.*
8. Has any Large Woody Material become dislodged? Has any Large Woody Material lost its backfill?
  - a. *No observations of dislodged Large Woody Material.*
9. What are the dates and flow estimates for the most significant flows in the project reach over the last year?
  - a. *Peak flows occurred between 6/12-6/22/2019 with the greatest discharge of 402 cfs on 6/12.*

CWCB Quality Assurance Review  
Wagon Wheel Gap, Fourmile Canyon Creek

10. Have you reviewed the monitoring and inspection data with the engineer of record?
  - a. *Our monitoring program is designed to identify potential triggers that may influence key stream functions. To date, we have not identified any potential triggers to discuss with the engineer of record. We will continue to monitor this site and will consult the engineer of record when necessary.*

## Memo – Annual Inspection Report

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**To:** Chris Sturm, CWCB

**From:** Saint Vrain Creek Coalition

**Date:** 6/27/2019

**RE:** Apple Valley South

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Per the requirements of the operations and maintenance plan for EWP projects, we have completed our annual inspection of Apple Valley South on Saint Vrain Creek. Below are responses to various questions regarding project status and condition. Included with this memorandum is the inspection report noting specific areas of concern and areas of success.

1. Is there any dense vegetation that may be reducing flood conveyance?
  - a. *No evidence of dense vegetation that may reduce flood conveyance. Willows line the banks, but do not reduce flood conveyance at high flow.*
2. Is there any dense vegetation that may cause debris hazards either by dislodging or by trapping other debris?
  - a. *No evidence of dense vegetation that may cause debris hazards.*
3. Is there any erosion that is threatening property, structures, or infrastructure?
  - a. *High flows inundating an area behind a large wood revetment in the upstream section of the project area at the Singer's property, but do not appear to be actively causing erosion. The revetment is designed to protect property and Apple Valley Road. We will continue to monitor to assess whether active erosion is occurring and connect with engineer as appropriate.*
4. Have any of the instream structures adjusted and maintained the original design intent?
  - a. *Only the observation noted above.*
5. Have any of the instream structures adjusted and not maintained the original design intent?
  - a. *No evidence of instream structures adjusting and not maintaining original design intent.*
6. Has the low flow channel adjusted laterally either through avulsion or through bank erosion or sedimentation?
  - a. *No evidence of low flow channel lateral adjustment.*
7. Has the bankfull channel adjusted laterally either through avulsion or through bank erosion or sedimentation?
  - a. *No evidence of bankfull channel lateral adjustment.*
8. Has any Large Woody Material become dislodged? Has any Large Woody Material lost its backfill?
  - a. *No observations of dislodged Large Woody Material.*
9. What are the dates and flow estimates for the most significant flows in the project reach over the last year?

CWCB Quality Assurance Review  
Wagon Wheel Gap, Fourmile Canyon Creek

- a. *Peak flows occurred between 6/12-6/22/2019 with the greatest discharge of 402 cfs on 6/12.*
10. Have you reviewed the monitoring and inspection data with the engineer of record?
  - a. *Our monitoring program is designed to identify potential triggers that may influence key stream functions. We recently identified a possible trigger with the wood revetment at high flow and will contact engineer of record.*

## Memo – Annual Inspection Report

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**To:** Chris Sturm, CWCB

**From:** Saint Vrain Creek Coalition

**Date:** 6/27/2019

**RE:** McConnell

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Per the requirements of the operations and maintenance plan for EWP projects, we have completed our annual inspection of McConnell on Saint Vrain Creek. Below are responses to various questions regarding project status and condition. Included with this memorandum is the inspection report noting specific areas of concern and areas of success.

1. Is there any dense vegetation that may be reducing flood conveyance?
  - a. *No evidence of dense vegetation that may reduce flood conveyance. Willows line the banks, but do not reduce flood conveyance at high flow.*
2. Is there any dense vegetation that may cause debris hazards either by dislodging or by trapping other debris?
  - a. *No evidence of dense vegetation that may cause debris hazards.*
3. Is there any erosion that is threatening property, structures, or infrastructure?
  - a. *No evidence of erosion threatening property, structures or infrastructure. High flows are cutting behind a large willow on river left on the Loukonen Stone property, but no present issue.*
4. Have any of the instream structures adjusted and maintained the original design intent?
  - a. *No evidence of instream structures adjusting.*
5. Have any of the instream structures adjusted and not maintained the original design intent?
  - a. *No evidence of instream structures adjusting and not maintaining original design intent.*
6. Has the low flow channel adjusted laterally either through avulsion or through bank erosion or sedimentation?
  - a. *No evidence of low flow channel widening and adjusting laterally due to bank erosion or sedimentation.*
7. Has the bankfull channel adjusted laterally either through avulsion or through bank erosion or sedimentation?
  - a. *No evidence of bankfull channel widening and adjusting laterally due to bank erosion or sedimentation.*
8. Has any Large Woody Material become dislodged? Has any Large Woody Material lost its backfill?
  - a. *No observations of dislodged Large Woody Material.*
9. What are the dates and flow estimates for the most significant flows in the project reach over the last year?

CWCB Quality Assurance Review  
Wagon Wheel Gap, Fourmile Canyon Creek

- a. *Peak flows occurred between 6/18-6/25/2019. Greatest discharge was roughly 974 cfs on 6/22.*
10. Have you reviewed the monitoring and inspection data with the engineer of record?
  - a. *Our monitoring program is designed to identify potential triggers that may influence key stream functions. To date, we have not identified any potential triggers to discuss with the engineer of record. We will continue to monitor this site and will consult the engineer of record when necessary.*

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: Apple Valley North

Project Sponsor: Saint Vrain Creek Coalition

### Wetland and Near Channel Vegetation

1. Areas of Concern
  - Upstream overflow overrun with Kochia, likely from imported topsoil. Warranty addressed, but issue needs additional work.
2. Areas of Success
  - Overall good cover and willow recruitment

### Riparian/Transitional Vegetation

1. Areas of Concern
  - Weeds and Kochia in transition zone, hand pulled in June 2019.
2. Areas of Success
  - Overall good cover



Kochia on bank of overflow, AVN, 6/20/2019

# Project Name

## Annual Inspection Report



### Upland Vegetation

1. Areas of Concern
  - Weeds in upland hand pulled in June 2019
2. Areas of Success
  - Overall good cover

### Seeded Areas

1. Areas of Concern
  - Major Kochia infestation in top soil areas
2. Areas of Success
  - Overall good cover



Upland/seeded areas downstream end of reach, AVN,  
6/20/2019

# Project Name

## Annual Inspection Report



### In-Stream and Grade Control Structures

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Structures maintaining form and function

### Bank Stabilization Features

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Other structures maintaining form and function



Pools at Rooney property, ANV, 6/20/2019

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: Apple Valley North

Project Sponsor: Saint Vrain Creek Coalition

### Instream Woody Materials (Large, Small, Naturally Recruited, etc.)

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Natural small wood recruitment on banks

### Floodplain Woody Material (Installed and Naturally Recruited)

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Natural recruitment in lower benches



Upstream end of reach/overflow, AVN,  
6/20/2019

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: Apple Valley North

Project Sponsor: Saint Vrain Creek Coalition

### Floodplain Roughness

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Small wood in floodplain throughout

### Sedimentation or Debris

1. Areas of Concern
  - Sedimentation occurring in overflow channel, no cause for immediate concern
2. Areas of Success
  - Sedimentation and debris occurring naturally



Sedimentation in downstream end of overflow, AVN, 6/20/2019

# Project Name

## Annual Inspection Report



### Other Notes

1. Areas of Concern
  - Gas pipeline exposed during high flows in overflow channel. We've contacted PG&E and they are working on scheduling a time to lower the pipe.
2. Areas of Success
  - Overall reach is in good condition aside from on-going weed issues.



Pipeline in overflow channel, AVN, 9/20/2019

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: Apple Valley South

Project Sponsor: Saint Vrain Creek Coalition

### Wetland and Near Channel Vegetation

1. Areas of Concern
  - Low willow survivorship, replanted in April 2019
2. Areas of Success
  - High survival of willows after replanting

### Riparian/Transitional Vegetation

1. Areas of Concern
  - Weed in transition zone hand pulled in June 2019
2. Areas of Success
  - Overall good cover



Willow stakes, mid reach AVS, 6/20/19

# Project Name

## Annual Inspection Report



### Upland Vegetation

1. Areas of Concern
  - Weeds in upland hand pulled in June 2019
2. Areas of Success
  - Overall good cover

### Seeded Areas

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Overall good cover



Mid reach AVS, 6/20/2019

# Project Name

## Annual Inspection Report



### In-Stream and Grade Control Structures

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Structures maintaining form and function

### Bank Stabilization Features

1. Areas of Concern
  - Upstream large wood revetment submerged at high flow and running water in banks behind the wood toe
2. Areas of Success
  - Other structures maintaining form and function



Wood revetment at Singer's property, AVS,  
6/20/19



Wood revetment at Singer's property, AVS,  
6/20/19

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: Apple Valley South

Project Sponsor: Saint Vrain Creek Coalition

### Instream Woody Materials (Large, Small, Naturally Recruited, etc.)

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Natural small wood recruitment on banks

### Floodplain Woody Material (Installed and Naturally Recruited)

1. Areas of Concern
  - Upstream wood revetment may be diverting high flows towards Singer's home and Apple Valley Road
2. Areas of Success
  - Other floodplain wood causing no concern



Instream wood downstream of King property, AVS, 6/20/19

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: Apple Valley South

Project Sponsor: Saint Vrain Creek Coalition

### Floodplain Roughness

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Small wood in floodplain throughout

### Sedimentation or Debris

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Sedimentation and debris occurring naturally



Downstream reach, AVS, 6/20/19

# Project Name

## Annual Inspection Report



### Other Notes

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Overall reach is in good condition

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: McConnell

Project Sponsor: Saint Vrain Creek Coalition

### Wetland and Near Channel Vegetation

1. Areas of Concern
  - No notable areas of concern.
2. Areas of Success
  - Willows doing well on banks.

### Riparian/Transitional Vegetation

1. Areas of Concern
  - Weeds in transition zone treated with herbicide in June 2019. Container stock had low survivorship and warranty (replanting) was addressed in April 2019.
2. Areas of Success
  - Overall good cover



Riparian vegetation, McConnell, 6/21/2019

# Project Name

## Annual Inspection Report



### Upland Vegetation

1. Areas of Concern
  - Weeds in upland, treated with herbicide in June 2019
2. Areas of Success
  - Overall good cover

### Seeded Areas

1. Areas of Concern
  - Seeded areas had low germination in zone 3. Warranty reseeding was completed in April 2019
2. Areas of Success
  - Overall good cover



Upland vegetation, McConnell, 6/21/2019

# Project Name

## Annual Inspection Report



### In-Stream and Grade Control Structures

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Structures maintaining form and function

### Bank Stabilization Features

1. Areas of Concern
  - Water flowing behind large willow. Will monitoring for scouring/erosion.
2. Areas of Success
  - Other structures maintaining form and function



Water flowing behind large willow river left next to open lot, McConnell, 6/21/2019

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: McConnell

Project Sponsor: Saint Vrain Creek Coalition

### Instream Woody Materials (Large, Small, Naturally Recruited, etc.)

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Natural small wood recruitment on banks

### Floodplain Woody Material (Installed and Naturally Recruited)

1. Areas of Concern
  - Limited recruitment. No areas of concern
2. Areas of Success
  - No notable areas of success



Instream wood, McConnell , 6/20/19

# Project Name

## Annual Inspection Report



Date: June 27, 2019

By: Left Hand Watershed Center

Location: McConnell

Project Sponsor: Saint Vrain Creek Coalition

### Floodplain Roughness

1. Areas of Concern
  - No notable areas of concern, channelized section of river
2. Areas of Success
  - No notable areas of success

### Sedimentation or Debris

1. Areas of Concern
  - No notable areas of concern, channelized section of river
2. Areas of Success
  - No notable areas of success



Downstream reach, McConnell, 6/21/19

# Project Name

## Annual Inspection Report



### Other Notes

1. Areas of Concern
  - No notable areas of concern
2. Areas of Success
  - Overall reach is in good condition