APPENDIX H

Fountain Creek Vision Task Force
Water Working Group
(Water Quality and Water Quantity Working Groups Combined)
Meeting Summaries

Fountain Creek Vision Task Force
Water Working Group
(Water Quality and Water Quantity Working Groups Combined)
Meeting Summaries

Fountain Creek Vision Task Force
Water Working Group
September 28, 2007
Final Meeting Summary

Attending

Carol Baker, Dan Bare, Barbara Dallemand, Dennis Darrow, Danny Elsner, Ferris Frost, Mark Glidden, Jane Green, Dan Henrichs, Nancy Keller, Irene Kornelly, Carole Lange, Dennis Maroney, Gene Michael, Rich Muzzy, Gary Rapp, Kathleen Reilly, Jane Rhodes, Lisa Ross, Bill VanDeveer, Ross Vincent, Tim Williams, Niki Koszalka, and Heather Bergman

Action Items

Pat Edelman, Carol Baker, and Scott Cowan	Review the writing of the proposal for the 319 grant
Carol Baker	Work with Pat Edelman to find the hydrologic over lay on the selenium map and get the map up electronically
Ross Vincent, Pat Edelman, Dan Henrichs, and Carol Baker	Study the soil overlay map and discuss it with the Water Working Group
Tim Williams and Dennis Maroney	Contact Scott Hobson and Dave Cockrell to see if they are able to help with the 319 grant writing
Dennis Maroney	Email stormwater retrofit information to Heather Bergman
Rich Muzzy and Lisa Ross	Lead the group in planning the workshop
Rich Muzzy, Lisa Ross, Dennis Maroney, Tim Williams, Barbara Dallemand, and Carole Lange	Participate in the workshop planning

New and Pressing Issues in the Watershed

Pueblo Democratic Meeting

- John Cordova received the majority of votes to take over for Loretta Kennedy, who has left the Pueblo Board of County Commissioners to work for Congressman Salazar.

Colorado Department of Public Health and Environment (CDPHE) 319 Grant Opportunity Update

- The CDPHE 319 grant is looking to target E. coli and sediment. The grant would also place a 20-foot Streamside System apparatus in Fountain Creek. Plans include having the removed sediment tested for E. coli and pollutant levels. Finding the non-point source for E. coli is a goal. There is a 40% match needed for this grant. The Lower Arkansas Basin Roundtable is a viable source for a match. The match can be in-kind or cash, but it cannot be federal

money and it has to be firm. Pat Edelman, Carol Baker, and Scott Cowan volunteered to review the grant writing. Scott Hobson started to write a grant on Streamside Systems for implementation near the confluence. Dave Cockrell of Pueblo Area Council of Governments (PACOG) may have expertise in this area. Tim Williams and Dennis Maroney will check with Scott Hobson and Dave Cockrell to see if they are able to help with the grant writing.

Selenium Updates (Carol Baker and Gary Rapp)

Carol Baker

- The Water Working Group reviewed a map showing selenium levels. The levels are higher at Wild Horse Creek and Pinion. The levels are also high in Monument and decrease with the addition of water from wastewater effluent and Fountain Creek. The selenium levels decrease when flow levels are higher. There is a selenium issue in the lower portions of Jimmy Camp Creek and Banning Lewis Ranch. A reduction of runoff would be most beneficial if it occurred upwards in the watershed.
- The Water Working Group request a selenium-levels map with an overlay with soils, showing what kind/types of soil they are. Carol Baker will talk to Pat Edelman to find the hydrologic soil overlay. Ross Vincent, Pat Edelman, Dan Henrichs, and Carol Baker will study the map and discuss it with the Water Working Group.

Questions and Answers

Is the map showing outcrops?
It is showing the underlying layers, the bedrock. The map shows where the alluvial waters would run over the outcrops, approximately 20-40 foot below the surface.

Are the new reservoirs, planned for Southern Delivery System (SDS), on top of the shale?
The Jimmy Camp Creek reservoir site is not located on shale, the upper Williams Creek reservoir site is partially on shale, and the Williams Creek reservoir site is mostly on shale. Pueblo Reservoir is on shale as well.

Does all the infiltrated water end up in Fountain Creek?
Except for the amount that evaporates, most of the infiltrated water ends up in Fountain Creek. Colorado Springs Utilities is not a proponent of infiltration of alluvial waters from areas over shale. Creating a detention area near the Creek causes the water to flow over a smaller area of shale, on the way to Fountain Creek.

The Army Corps of Engineers has some potential sites for dams. How will these impact selenium levels?
The impact on selenium levels is unknown at this time.

Gary Rapp

- The Western slope has very high levels of selenium. The infiltration of irrigation water is making the levels of selenium rise. Mancos shale is prone to erosion, especially in an area with under 18 inches of precipitation. When this kind of area is developed and irrigated, it creates a flush of selenium. More efficient irrigation techniques are necessary. The Selenium Task Force (www.seleniumtaskforce.org) has studied different types of vegetation to help uptake selenium. The next question for the Selenium Task Force is how they will deal with urbanization.

- The new proposed draft of the Clean Water Act Section 303 (d) showed Monument Creek and the lower Fountain Creek no longer on the list. Achieving an ambient standard is due to the selenium being from natural sources.

Questions and Answers

Is it reasonable to suspect that the selenium in the soil and shale will exhaust itself?
The selenium in the soil and shale are a historic problem. They will not go away.

Report on Drainage Criteria Questions (Dennis Maroney)

- The Drainage Criteria Sub-Group came up with a framework for future discussions on drainage criteria. The framework included the following tasks: education, identifying scope, identifying goals, reviewing published strategies/industry standards for achieving these goals, identifying relationships of the chosen strategies, evaluation, implementation, and considering the recommendations from the Army Corps of Engineers.

Questions and Answers

Could the Land Use and Environment Working Group work in conjunction with the Water Group on the drainage issue?
They could pursue the same course but the outcome might not be the same.

Did the group look at a way to share information with all of the communities?
That was the initial plan. There will need to be a discussion about how to get the information to the communities.

Would it be more effective to invite feedback from the developers?
It would be a good idea to have them participate in the process. It would also be a good idea to give them invitations to participate in the Fountain Creek Vision Task Force working groups.

Report on Policy Review (Dennis Maroney)

- There are model principles from the "Better Site Design Handbook." These principles help show how the municipalities match up. The model principles are not appropriate for national design standards. Some of the principles will not apply to the Fountain Creek watershed.
- The model development principles generally fall into one of three areas: residential streets and parking lots, lot development, and conservation of natural areas.
- A perfect score is 100. The following numbers in parenthesis are the scores from each entity. Colorado Springs (71), El Paso County (42), Fountain (57), City of Pueblo (55), Pueblo County (49), and Woodland Park (53) all participated in the survey from Better Site Design. The lower the score, the more opportunities exist for improvements.

Questions and Answers

It appears the counties are generally scoring lower than the cities. Is there an obvious reason?
It seems the counties had a harder time answering the questions that the cities. The counties also have fewer building codes, which also may make a difference. Not all of the principles in the Better Site Design book may apply to the Fountain Creek watershed.

What were the common areas for improvement, if any?

Streets and parking lots were a common area for improvement.

Next Steps for drainage criteria and policy review

- The Water Working Group would like to host a workshop further educating developers, municipalities, homebuilders, planners, and citizens on the principles of Better Site Design and Low Impact Development (LID). There is some grant money available through the education portion of the 319 grant.
- Rich Muzzy and Lisa Ross will spearhead a group to discuss the workshop. The workshop group will include Dennis Maroney, Barbara Dallemand, Tim Williams, and Carole Lange. Rich Muzzy and Tim Williams will find a speaker about green building for the workshop.
- Heather Bergman will bring Better Site Design book to the next meeting for the Water Working Group.

Fountain Creek Vision Task Force
Water Working Group
October 25, 2007
Final Meeting Summary

Attending

Carol Baker, Dan Bare, Pat Edelmann, Mike Fink, Ferris Frost, Mark Glidden, Merle Grimes, Dan Henrichs, Irene Kornelly, Carole Lange, Gary Rapp, Lisa Ross, Graham Thompson, Bill VanDerveer, Ross Vincent, Alan Ward, Niki Koszalka, and Heather Bergman

Next Steps

Heather Bergman	Create a simple outline for current needs and conditions document
Heather Bergman	Send a zoomerang survey to create writing groups for the current needs and conditions document

New and Pressing Issues in the Watershed

- The Greenway Foundation invited the Task Force to Denver to see the restoration work done along the South Platte River through Denver.
- The Colorado Streamside Code goes back to City Council November 13, 2007.

Sediment Transport, Erosion, and Channel Stability (Graham Thompson and Pat Edelmann)

- The major issues for the Fountain Creek Watershed are flooding, erosion, and sedimentation. All of these issues are interrelated. Population growth has led to changes in land use. Changes in land use have led to an increase in water quantity. The stream system responds to these changes by adjusting through erosion and sediment, which are natural processes.
- When areas erode, the river picks up particles. When there is sedimentation, the same particles picked up by the river later are dropped.
- It is important to distinguish "channel forming flows" from the peak flows of 1999.
    - Channel-forming flow is a representative flow that is responsible for shaping the natural channel over time. There are three methods for measuring channel-forming flow: bankfull discharge (field morphology), specified recurrence interval (flow

statistics), and effective discharge (mathematical). In theory, the results of all three agree.
    - Fountain Creek flows:
        - 1999 flood flow was approximately 20,000 cubic feet per second (cfs)
        - Bankfull discharge is approximately 2,000 cfs.
        - Effective discharge is approximately 200 cfs.
        - Average base flow is 50-100 cfs.
        - 100-year flood is 50,000 cfs.
- There is some movement of sediment regardless of flows. Low flows are capable of transporting fine to course sands. Low flows are capable of undercutting/undermining banks and causing bank erosion, leading to loss of property.
- Base flow conditions transport about 100 tons of sediment per day at 100 cfs and 10,000 tons of sediment per day at 1,000 cfs.
- There are reaches in Fountain Creek where sediment deposition occurs, and with specific flow conditions accumulations occur. The Fountain Creek Watershed Study determined that the Creek wanted to erode and identified where it wanted to deposit the sediment. Most of the sediment depositions are close to the point of erosion. Usually a big erosional area means there is a large depositional area. From a planning perspective, approaching sediment from a reach-to-reach basis is imperative.
- Creeks have the ability to fix themselves, but this takes a considerable amount of time. Dealing with a considerable amount of sediment is also challenging. To cut sediment load by 1/10 and double the amount of channel-forming flow, the channel width would increase to twice as wide and with approximately 155 dump trucks full of sediment needing removal.
- Taking on a restoration project would include:
    - Using a natural channel design approach
    - Paying a design fee of approximately $30,000
    - Incurring an estimated construction cost of at least $50,000
    - Scheduling construction costs for fiscal year 2008
    - Paying an estimated $30 to $500 per foot
    - Completing the project (from design work to construction) in about a year
- When dealing with sedimentation there are applied science techniques that are of assistance such as:
    - Acquiring more sediment load data (also can be used for design purposes)
    - Having more effort to identify source areas
    - Isolating the tributaries and uplands
    - Measuring stable reaches
    - Protecting stable reaches
    - Utilizing demonstration projects
    - Targeting low-hanging fruit and high priorities

Questions and Answers:

Is the volume of the flow more important than the speed?

The size of the flow is reflective of the size of the stream. A consistent flow of 2,000 cfs requires a wider streambed than Fountain Creek has.

Should the group be focused on the base flow or channel flow?

The group needs focus on both.

Would the ideal detention facility trap the water but let sediment go through?
Rivers carry water and sediment. Cutting off one or the other will have impacts on the stream.

There is a perception that the problems in the watershed can be totally solved when there is a natural/necessary element. How does the group find the proper a balance?
It is a challenge to figure out what is a natural process and what is not. In terms of restoration, one does not want to fix something that is not broken. It is important to remember that rivers are naturally dynamic systems, convey both water and sediment, are not straight, and have measurable/reproducible forms. Both erosion and sedimentation are natural processes. When considering balance is it necessary to consider the following:

- Sediment (it is not evil)
- Channel stability concept
- Streams responding to change
- Impacts can be so obvious, no detailed analysis is needed
- Methodologies are available to access whether the observed area impact is natural or induced instability
- Downstream impacts
- Corridor encroachment
- Goals that are functionally established

Rivers are always moving. What do we fix?

- Floods move through the floodplain. If a floodplain is encroached, there is more chance for a catastrophic flood. Clearing the floodplains could help avoid disaster in a flood event.
- Attempts to use what will naturally occur on Fountain Creek may result in the ability to articulate the sinuosity of a given reach of the Creek. This also may mean no real estate in certain areas.
- Another approach prioritizes the induced impacts and determines how to reduce these impacts.

What would a core sample of sediment at the confluence consist of?
There would be bedload and larger particles, but mostly it would be smaller particles. Based on velocity and sheer stress of the specific area, it is common to see the bed change by several feet.

Before there were transmountain flows, what were the cfs rates?
An estimate is probably 25 to 30 cfs in Colorado Springs and at Pueblo less than 5 cfs.

How much change has there been in agriculture return flows in the past 50 years?
The return rate was less. This is a function of development, more growth, and more effluent discharge stewarded downstream.

How does vegetation influence the sediment deposition?
There is a lot more deposition. More vegetation will slow down flows and cause more deposits.

What are the major causes of erosion in the tributaries?

- An over-simplified answer is changes in the base flow. The stream adjusts to more water by deepening or widening the streambed. Anything done to stop further constriction of the floodplain would be helpful. When there is an encroachment issue, it will affect the whole watershed. This affects not only floodplain but also the pattern of meander. If Fountain Creek increases its water quantity, the anticipated natural phenomenon downstream is a widening of the river. However, the actual stream response is to make sharper turns instead of going wider.

Next Steps for Sediment Transport, Erosion, and Channel Stability

- The interim and ultimate plan needs to include:
  - Developing a comprehensive master plan and integrating the entire watershed
  - Developing goals
  - Approaching ideas and solutions in a system-based manner
  - Prioritizing areas/reaches
  - Making difficult choices
  - Being aware of changing flows and loads
  - Creating multi-stage channels
  - Creating small, frequent grade-control structures
  - Monitoring/maintaining to make sure that the improvements/changes stay

Questions and Answers

Is planning done with a function for the whole watershed or with particular reaches of the creek having a specific function?

Depending on the users and the owners, the goals could be quite different. Function does not have to be the same but they have to be well defined and stable.

Will the Army Corps of Engineers (the Corps) help the Task Force with this process?

The Corps will help to lay the foundation but does not function as an implementation or design entity.

What are options in controlling flow?

Some options for controlling the flow are:

- Being conservation-minded
- Being proactive
- Working with source control
- Utilizing Low Impact Development (LID) techniques
- Using detention ponds distributed through out the watershed
- Creating wetland areas
- Improving floodplain connectivity and channel sinuosity

Colorado Water Conservation Board Grant Requirements

- The Task Force has the baseline information including presentations and summaries. The Task Force needs to write up a current needs and conditions report.
- The Task Force feels it is tending to most of the groups key interests. The group needs to pay more attention needs to stable base flows.

- ❖ Heather Bergman will give the Task Force a simple outline to follow when creating the current needs and conditions report and send a zoomerang survey as an aid in drafting groups to write the report.

Next Steps

- ❖ The Working Group will prioritize the issues that have the most impact on sediment transport and present it to the Consensus Committee.
- ❖ The Working Group will undertake a high-level goal discussion at the next meeting. This discussion will include prioritizing the sources and impacts and establishing what the group wants to see in different areas of the watershed.
- ❖ The Working Group wants to discuss sedimentation with the Consensus Committee to discuss what the low-hanging fruit might be.
- ❖ The next Water Working Group meeting is November 30, 2007, from 9:00 a.m. to 12:00 p.m.at Fountain City Hall.

Fountain Creek Vision Task Force
Water Working Group
November 30, 2007
Final Meeting Summary

Attending

Bill Alt, Carol Baker, Dale Carter, Barbara Dallemand, Dennis Darrow, Ferris Frost, Mark Glidden, Kim Headley, Dan Henrichs, Mary Jaurequi, Mark Johnston, Irene Kornelly, Carole Lange, Dennis Maroney, Gene Michael, Rich Muzzy, Julie Pearson, Gary Rapp, Sandy Rayl, Lisa Ross, Alan Ward, Niki Koszalka, and Heather Bergman

Action Items

Niki Koszalka	Send a list of the brainstormed potential functions for Fountain Creek
Water Working Group	Flesh out, polish, and resubmit the brainstormed potential functions for Fountain Creek
Heather Bergman	Review, make changes, return, and have the current conditions documents ready for the January Consensus Committee meeting

New and Pressing Issues in the Watershed

- ❖ Colorado Springs Utilities (CSU) considered the input on a wastewater treatment center near Clear Springs. Instead, CSU will put in pump stations and utilize the existing wastewater treatment plants. The Lower Fountain Wastewater Treatment Facility is still under consideration and moving forward.

Groundwater Monitoring at Clear Spring Ranch (Dale Carter)

- ❖ The Clear Springs Ranch Groundwater Monitoring Station is a multi-use property that includes power plants, a gravel mine, and solid waste disposal sites. The solid waste disposal site includes construction debris, alum sludge, ash disposal, and biosolids disposal. After treatment in the wastewater treatment digesters, biosolids are the result of sludge. Before

plowing the biosolids into dedicated land areas, the biosolids undergo further treatment in holding points.

- Groundwater monitoring occurs for three solid waste disposal sites. Installing seventy wells helped CSU understand the hydrogeology of Clear Spring Ranch. More than 170 additional drilled boreholes help to determine bedrock elevations. The data from the wells and the bedrock help create groundwater contour maps.
- The test parameters include nitrate, chloride, selenium, arsenic, chromium, and nickel. Nitrates and selenium are indicator parameters, metals are a requested parameter from the Environmental Protection Agency (EPA), and chloride is a recent addition by the Colorado Department of Public Health and Education (CDPHE).
- The groundwater data for nitrates is:
    - Drinking water standard – 10 mg/L (milligram per liter)
    - Up-gradient wells range from 5-23 mg/L
    - Compliance wells range from 11-18 mg/L
    - Fountain Creek Alluvial wells range from 1-3 mg/L
- The groundwater data for selenium is:
    - Drinking water standard – 0.05 mg/L
    - Up-gradient wells range from 0.02 to 0.3 mg/L
    - Compliance wells range from 0.005 to 0.14 mg/L
    - Fountain Creek Alluvial Aquifer wells range from 0.01 to 0.02 mg/L
- Arsenic, chromium, and nickel have consistently had "non-detect" results for all monitoring wells.
- For nitrate and selenium, up-gradient concentrations are compared to down-gradient compliance-well concentrations using software (Sanitas). The analysis shows no statistically significant increase in nitrate and selenium due to the biosolids operations. There is insufficient data for statistical analysis of chloride but data collected so far shows that down-gradient concentrations are lower for chloride.
- Through the years, a good understanding of the hydrogeology of the site has developed. Analysis of groundwater data shows that adverse impacts to groundwater are not occurring from biosolid disposal operations. Continued monitoring is necessary to detect early signs pointing to further controls needed to prevent impacts from occurring in the future.

Questions and Answers

Why did the State ask for the technical analysis method to be changed?
Modification was necessary to fit the method to wells that were not preexisting. The wells are new so the old standards did not work. The State asked CSU to use the new methods instead.

Is vegetation used on the land disposal unit?
The land is plowed so regularly that not much grows. Some weeds will grow between plowing. Salt concentrations will rise to the point that there will be no vegetative growth.

What is a terrigator?
A terrigator is a six-wheeled truck that has plow wheels that dig down six inches and drops biosolids.

Does surface water leave the site?
No surface water leaves the site. The dam keeps water on the land.

Are biosolids tested for toxic material before being added to the soil?
Before transporting the biosolids to the land disposal unit, the treatment plant does much testing. In a groundwater-monitoring program, there is a selected suite of parameters to test. This is a detection-monitoring program.

Where are the two wells for the testing of groundwater, and are they in the area of the downrange munitions?
The wells are near Fort Carson and are considered up-gradient wells.

Are you testing for lead or mercury (by produce of munitions)?
Have not tested extensively, but there are general, overall, and far-reaching testing.

Are the groundwater wells deep and would the above questions be more appropriate if dealing with surface water from Fort Carson?
The wells are 40 feet down. Fort Carson surface water is diverted around Spring Creek.

At what point will the concentrations be too high and what is the extinction period for the monitoring plant?
The land disposal unit will reach capacity when the soil becomes too gummy for the terrigator to turn over the ground. Some of the parameters will be neutralized by naturally occurring microbes. The most apparent constraint will be when the soil cannot take more biosolids and maintain soil consistency.

Has there been any thought or planning to use the biosolids for agriculture fertilization?
That is a different type of operation, with certain kinds of fields. There are issues of metals going out to agriculture land. Many regulations go into making biosolids available for fertilizer.

How is the sludge transported?
All sludge from the CSU wastewater treatment goes to waiting ponds by pipeline.

Are you still operating on the EPA permit that expired in 1999?
No, there has been a new permit.

Why was the pump installed in 1998?
In 1994-1995, there were elevated nitrate levels found beyond the dam. Installing a layer of betonite inside the wall of the dam proved no immediate changes. Installing the French drain and pump outside of the dam had good results.

If the pump back system failed, what could happen?
CSU does not intend to let it fail. If it did, the nitrate numbers could climb.

Are the winds on the open fields an issue?
This is somewhat of an issue from time to time. The biomass does help to bind the soil.

Brainstorm: Potential Functions for Fountain Creek

- Protect public health, Fountain Creek may decide to meet stream standards as set by CDPHE/EPA
- Reduce the suspended sediment load transport through out Fountain Creek watershed
- Reduce flooding potential in Fountain Creek watershed
- Change development practices to enhance health of watershed by controlling flooding and sediment loads
- Maintain existing and add additional stable riparian and wetland habitat areas
- Create and prohibit multi-functional recreational trails connecting all communities
- Eradicate invasive species and replace with more native species
- Preserve and protect agricultural, open space, and floodplains
- Maintain Fountain Creek as an effective and efficient conveyer of water
- Reconnect the channel to the floodplains and connect the floodplains
- Protect native ecosystem and wildlife
- Protect and encourage agriculture in the area including flood control and a buffer zone
- Meet or exceed established water quality standards
- Reduce/manage non-native flows, stormwater flows, and wastewater flows
- Stabilize channel bed/banks
- Reconnect the floodplains and channels
- Manage/enhance/acquire riparian habitat
- Control noxious vegetation; map noxious vegetation
- Identify and prioritize projects
- Create common/regional policies and procedures

Progress on Current Conditions Documents

- The recently started stormwater current conditions document is going well so far.
- Work on the municipal water and return flows current conditions document is to start next week.
- The water quality group is well on their way and Rich Muzzy is to finish process next week.
- The flooding and flood Control group is collecting information and condensing the information to a two-page document.
- Stephanie Carter is taking on the writing of the sedimentation current conditions document with the help of Mary Barber. They are meeting next week.
- The current conditions documents are due on December 7, 2007. Heather Bergman will review, make changes, return, and have documents ready for the January Consensus Committee meeting.

Next Steps

- Coming up with strategies for functions is very hard work and is a brainstorming process.
- The Water Working Group discussed different options to achieve strategies.
- Niki Koszalka will send out the brainstormed potential functions for Fountain Creek. The Water Working Group will flesh out, polish and resubmit these ideas.
- The Water Working Group would like to start this process independently. It will be less intimidating or limiting then working exclusively with the Corps study. The Fountain Creek Vision Task Force will take on the first step, followed by a meeting with the Corps.

- The Water Working Group would like to have two groups, one reflecting the Corps study and the other working independent of the Corps study.
- The next meeting for the Water Working Group will be a joint meeting with the Land Use/Environment Working Group. This will be a four-hour meeting on January 17, 2007 from 1:00 to 5:00 pm.