

## **WATER RESOURCES ADVISORY BOARD MEETING**

**MEETING DATE: Monday, 20 July 2015**

**MEETING TIME: 7:00 p.m.**

**MEETING LOCATION: Municipal Services Center, 5050 Pearl St., Boulder, CO 80301**

### **Agenda Highlights:**

1. Call to Order (7:00 p.m.)
2. Approval of 27 April, 18 May and 22 June Meeting Minutes (7:01 p.m.)
3. \*Public comment (7:05 p.m.)
4. Information Item – Pre and Post Fire Watershed Planning (7:15 p.m.)
5. Information Item – Wastewater Treatment Update (7:45 p.m.)
6. Matters From Board (8:10 p.m.)
7. Matters From Staff (8:15 p.m.)
  - Flood Mitigation Benefit-Cost Analysis Methodology
8. Future Schedule (8:40 p.m.)
9. Adjournment (8:45 p.m.)

\* Public Comment Item

**Agenda item times are approximate.**

### **Information:**

- Please contact the WRAB Secretary email group at:  
[WRABSecretary@bouldercolorado.gov](mailto:WRABSecretary@bouldercolorado.gov)
- Packets are available on-line at: <http://www.bouldercolorado.gov> – [A to Z, Water Resources Advisory Board \(WRAB\), Next Water Resources Advisory Board Meeting](#)

**CITY OF BOULDER, COLORADO  
BOARDS AND COMMISSIONS MEETING MINUTES**

<b>Name of Board / Commission:</b> Water Resources Advisory Board	
<b>Date of Meeting:</b> 27 April 2015	
<b>Contact Information of Person Preparing Minutes:</b> Andrea Flanagan 303.413.7372	
<b>Board Members Present:</b> Vicki Scharnhorst, Dan Johnson, Ed Clancy, Mark Squillace <b>Board Members Absent:</b> Lesley Smith	
<b>Staff Present:</b> Jeff Arthur, Director of Public Works for Utilities Annie Noble, Flood and Greenways Engineering Program Coordinator Katie Knapp, Engineering Project Manager Kristin Dean, Utilities Planner Ken Baird, Utilities Financial Manager Douglas Sullivan, Acting Principal Engineer for Water, Wastewater and Stormwater Tom Settle, Water Treatment Manager Ward Bauscher, Engineering Project Manager Kevin Clark, Utilities Project Manager, Sourcewater Infrastructure Steve Buckbee, Engineering Project Manager Christin Shepherd, Civil Engineer Milford John-Williams, Budget Analyst Andrea Flanagan, Board Secretary  <b>Cooperating Agencies Present:</b> Alan Turner, Senior Project Manager, CH2M HILL Shea Thomas, Urban Drainage and Flood Control District	
<b>Meeting Type:</b> Regular	
<b>Agenda Item 1 – Call to Order</b>	<b>[7:00 p.m.]</b>
<b>Agenda Item 2 – Approval of the 16 March 2015 Meeting Minutes</b> Motion to approve minutes from March 16 as presented. <b>Moved by:</b> Squillace; <b>Seconded by:</b> Johnson <b>Vote: 4:0 (Lesley Smith absent)</b>	<b>[7:00 p.m.]</b>
<b>Agenda Item 3 – Swearing In/ Election of Officers</b> Ed Clancy was sworn in for his term on the WRAB.  <b>Motion by:</b> Johnson; <b>Seconded by:</b> Squillace Move to postpone election of officers until such a time as all five board members are present to vote. Current arrangement of officers would continue until that time. <b>Vote: 4:0 (Lesley Smith absent)</b>	<b>[7:03 p.m.]</b>
<b>Agenda Item 4 – Public Participation and Comment</b> <b>Public Comment:</b>  <b>Karl Anuta, Crif Crawford, Bruce Thompson (each speaker took a portion of the pooled time)</b> Karl Anuta spoke on behalf of residents of Frasier Meadows Retirement Community and presented a petition with signatures to the Board to ask for their support in the construction of a flood control facility, south of highway US 36. Citizens are concerned about the South Boulder Creek area, which the city has studied for many years. Over 300 homes of the total homes damaged by the flood event were on the west side of Foothills. This is not a flood that came up through basements, or caused by an over-taxed sewer system. This flood damage was caused strictly by surface water flowing over the turnpike and into homes, as well as the retirement community. Much of the Frasier Meadow's infrastructure was severely damaged, including several major buildings. Asking for Board support for construction of this area.  <b>Crif Crawford:</b> Showed videos of flooding at: Table Mesa and US 36, Frasier Meadows (from Thunderbird), Underground Garage to illustrate the flows and seriousness of the flood waters in their community.	<b>[7:04 p.m.]</b>

**Bruce Thompson**

Asking for Board support to further prevent water from South Boulder Creek Basin from topping over US 36 and overflowing into residential areas, west of Foothills Parkway. Highest priority is saving lives. If anyone had been in the Frasier Meadows parking garage, they might not have survived. It took less than 15 minutes to take 88 cars. Residents had to be carried across 3 feet of water to safety, which is a miracle that no one was lost. 43 residents of Frasier Meadows are present today and instead of speaking individually, they signed a sheet agreeing to these comments.

**Al LeBlang**

Concurs with the aforementioned statements.

**Clinton Heiple**

This was not a gently rising flood; this was water that came on very quickly and if anyone had been sleeping in their basement they could have died. Primary responsibility of government is to protect the lives and safety of its citizens. Hopes for Board to move forward.

**Laura Tyler**

Member of the South Boulder Creek Steering Committee, shared update about what the group is doing. Concerned that safety piece was not addressed at earlier study session. Group has reached out to City Council members, as well as University of Colorado (CU) staff. Reactions have been overwhelmingly positive. Council sees this as an opportunity to cooperate with CU. CU representatives are very positive and both groups clearly see the seriousness of this situation. There is a feeling of momentum. Shared a clip from Daily Camera about annexation and shared quote about the city’s plans for South Boulder Creek Mitigation Project and Southeast Boulder section and wanted to include this as part of the conversation. This conversation is happening and it is very positive.

**Payson Sheets**

Spoke about a possible future hazard that he would like to have avoided, with regard to expansion of Eldora ski area. Family moved to Boulder in 1920’s and remembers ski area working cooperatively with residents, but they are now unwilling to listen to residents. Sediment load is going into Peterson Lake and they would like to build additional trails, which would cause greater sediment issues. The ski area has been granted an expansion in both directions. EPA in Denver looked at their plans and found that the environmental impact statement was incomplete, and they were unable to assess the environmental impacts. Feels that this needs to be reassessed by the City. Nederland Advisory Board is preparing objections and he urges Board to file a firm objection to the expansion. Read from a key statement by Bret Linenfelser from April, 2014. Appreciates anything the Board can do to protect Boulder Creek.

**Jim Johnson**

Represents Southeast Boulder Neighborhood Association, which includes surrounding neighborhoods. Appreciates Board hearing the group’s message, which is that they want to work together with the City, County and FEMA to prevent water from further flooding these neighborhoods. Held up a map to show the Board. Hopes group can plan ahead with University of Colorado and would appreciate anything the Board can do to work with these entities to help protect residents. Mitigation is needed badly.

**Agenda Item 5 –**

**[7:28 p.m.]**

**Public Hearing and Consideration of a Recommendation to City Council Regarding the Gregory Creek Mitigation Study**

Katie Knapp and Utilities staff presented the item to the board.

**Executive Summary from the Packet Materials:**

The purpose of this memorandum is to present the Gregory Canyon Creek Draft Flood Mitigation Plan (**Attachment A**) for the WRAB’s consideration, input and recommendation to Council.

The city has retained CH2MHill to evaluate potential alternatives to help alleviate future flooding along Gregory Canyon Creek. CH2MHill’s Alternative Analysis Memorandum (“Analysis”) is included as

Appendix A of the Draft Flood Mitigation Plan (**Attachment A**). This Analysis contains a detailed description of the data and models used to determine the improvements which would help flood conveyance along Gregory Canyon Creek. The intent of the Analysis was to identify various types of improvements which could be constructed along the creek corridor, assess the costs and benefits associated with each improvement, and include an engineer's recommendation.

Staff reviewed the Analysis and developed a staff recommended plan based on the engineering recommendation, input from the public and observations from the 2013 flood event. The staff recommended plan is illustrated graphically in Section 6 of the Draft Flood Mitigation Plan (**Attachment A**) which also includes additional information about the Gregory Canyon Creek watershed, the planning process and the alternatives considered. Please note that not all sections of the document have been completed. Pending consideration and input from WRAB, conceptual drawings will be developed and the mitigation plan will be finalized and presented to City Council for acceptance.

**WRAB Discussion Included:**

- Question about four private culverts and asked if property owners agree to dedicate easements in order for city to install
- Question if residents support installing a pedestrian bridge.
- Stated that it is likely that we will exceed a ten-year flood and questioned if infrastructure will support anything greater than a 10-year flood.
- Asked about the cost-to-benefit analysis and questioned the numbers presented because they did not match what is in the report.
- Commented that a 7% discount rate is not realistic. Concerned that if the discount rate is changed, the numbers will be skewed.
- Suggests the calculations be made under different discount rates. Numbers seem speculative.
- Stated that the culvert replacement over the ten-year event does make sense.
- Asked for further clarification on method used for property acquisition.
- Stated that it is odd that city would agree to pay for the easements and suggested further discussion of this topic.
- Asked if there is a consideration at this time for what would come first as a priority, so that larger problems are not created and requested further clarification of the overall timeline approach.
- Questioned how the benefits get assessed in this situation.
- Requested further clarification on road improvements and property acquisition and whether these aspects could not be made part of the recommendation and instead, be a part of another program?
- Stated that this project affects neighborhoods directly and recommends a more adaptive approach that allows adjustments as more information is found out and suggests adding this to recommendation.
- Requested clarification on whether there is a reason that street improvements need to be included in the recommendation.
- Stated that Board has been discussing Gregory Creek since 2008 and something needs to happen.
- Requested whether it is normal practice for landscaping to be replaced, if damaged.
- Recommended that residents be asked to grant easements without compensation, as to allow funding to be stretched.
- Stated that if property value increases, it seems odd that the city would pay for easements.

**Public Comment:**

**Holly Pearen**

Stated that staff and Board have been very open and solicitous to the neighborhood concerns. As the plan has developed, the landowners have some concerns, both on macro and micro scales. Inconsistencies lead to deep concern. Glad that benefit-cost analysis has been addressed. The value of the damages presented in the documents are inconsistent. Has to be some sort of calibration to what actually happened. Understands that the damages are estimated, but this cannot be accurate. No realistic assumptions about the value can be made based on these numbers. Open to hearing explanation as to

how these numbers were arrived at from CH2M Hill. Landowners would appreciate if city and CH2M Hill could be more transparent about the cost to landowners. If in fact properties gain or lose value, tell them how much and reflect this in the budget. If easements will be given to the city for free, this may not be realistic, especially based on her experience throughout this process.

**Stewart Machle**

Would like to thank city for all the help given to him since the flood. Rock walls have been rebuilt. Question about intersection of Anderson Ditch and Gregory Creek. Heard comment about an overhead culvert or culvert separate from Gregory Creek and agrees they should be separated. Asks if a decision has been made about what is going to be done with this location, as this is a critical area.

**Laz Nemeth**

Asked why everyone is in favor with box culverts. They are ugly. Preference is for keeping Anderson Ditch open so children can play there. Running water is aesthetically pleasing. Based on personal experience, Anderson Ditch was actually shut off during the flood. There was no more flow in Gregory Creek afterwards. Something needs to be done. Asks if there is a reason for always having two box culverts and if it is more cost-effective.

**Rebecca Roser**

Part of her property is Anderson Ditch, which goes to the edge of her property. Flows stopped in Anderson Ditch, because it was filled to the top with silt during the flood. Agrees that the area where Gregory Creek and Anderson Ditch come together is an issue because it's at the edge of her property. Appreciates that neighbors have been solicited and looking forward to working with city with regard to easements.

**Motion by:** Squillace; **Seconded:** Johnson

**Vote:** 4:0 (Lesley Smith absent)

**Motion Passes**

Staff requests Water Resources Advisory Board consideration of this matter and action in the form of the following motion:

**Motion to recommend the Gregory Canyon Creek Flood Mitigation Plan be finalized based on the Staff Recommended Plan and presented to City Council for acceptance.**

**Agenda Item 6 –**

**[8:40 p.m.]**

**Information Item – Preliminary Draft 2016 Utilities Budget (Water, Wastewater and Stormwater/ Flood Management) including the 6-year Capital Improvement Program (CIP)**

**Douglas Sullivan, Ken Baird, Annie Noble, Kevin Clark, Steve Buckbee, and other Utilities staff presented the information item to the board.**

As part of the city's annual budget process, Utilities develops a six-year planning budget, this year for the time period of 2016 through 2021. The Water Resources Advisory Board (WRAB) role in this process is defined in the Boulder Revised Code: "... to review all environmental assessments and capital improvements conducted or proposed by the utilities division." Utilities staff has formulated initial revenue and expenditure projections for each of the three utility funds through the year 2021. Within the budget process, City Council approves and appropriates funds only for the first year, 2016. In addition to the six year CIP described above, Utilities staff develops a 20-yr CIP. The purpose of the 20-yr CIP is to look at long range needs for all three utilities. The 20-yr CIP is a valuable mechanism to look at upcoming regulatory requirements, asset management needs for aging facilities, and the associated debt service for existing bonds.

This agenda item provides an opportunity for the WRAB to discuss a "preliminary draft" of the CIP. Input from WRAB will guide staff in preparation of a draft CIP for discussion by WRAB at the May meeting. WRAB will be asked to make a recommendation to City Council regarding the 2016-2021 CIP at its June meeting. The Planning Board will review the complete city CIP, including utilities, in July. City Council generally plans for two study sessions in September, prior to adopting the 2016 budget.

<b>WRAB Discussion Included:</b>	
<ul style="list-style-type: none"> <li>• Stated that there is some concern that the rate increases may be a bit heavy, considering they have been flat for so long. Concerned that rate increases won't stop. This could largely impact commercial users.</li> <li>• Stated that perhaps we should exercise more thoughtfulness on how we conserve water and consider the possibility of selling our product (water) while we have it. If we continue to conserve, what are we losing in revenue?</li> <li>• Stated that the issue is complicated, because if we don't conserve, then we need to acquire new water supplies.</li> <li>• Stated that these changes could be more significant than the public may even understand.</li> <li>• Expressed concern that we may be on a track that is not aligned with inflation.</li> <li>• Stated that what some local communities want that is in the best interest of protecting their properties, may not actually be what's best for the community at large.</li> <li>• Commented that we do need to play catch-up on sewage updates, as we saw what happened during the flood event in 2013.</li> <li>• Stated that CII was never completed and suggest revisiting.</li> <li>• Asked whether there is any potential to sell any of our resources to generate additional revenue.</li> <li>• Questioned whether our plant investment fee is high enough and whether or not it is fair for people who buy in later.</li> <li>• Questioned if there was any conclusion that came from the inspection of sewer lines that were inspected by a pipeline 'submarine.'</li> </ul>	
<b>Agenda Item 7 – Matters from the Board:</b>	<b>[10:12 p.m.]</b>
<b>Board Member Clancy brought up the below matter(s):</b>	
<ul style="list-style-type: none"> <li>• Requested clarification on dates for future open houses.</li> <li>• Requested to find out if PowerPoint presentations will be posted following meetings.</li> </ul>	
<b>Board Member Johnson brought up the below matter(s):</b>	
<ul style="list-style-type: none"> <li>• Requested more information on Eldora expansion, with regard to public comment.</li> </ul>	
<b>Agenda Item 8 – Matters from Staff:</b>	<b>[10:15p.m.]</b>
<ul style="list-style-type: none"> <li>• Kim Hutton provided an update on water supply for 2015. There is no need to implement water restrictions at this time, based on current snow pack conditions.</li> <li>• Department of Health and Human Services has recently released a fluoride recommendation. City is determining next steps and will follow up at future meeting.</li> </ul>	
<b>Agenda Item 9 – Future Schedule</b>	<b>[10:24p.m.]</b>
<b>May:</b>	
<ul style="list-style-type: none"> <li>• South Boulder Creek Mitigation</li> <li>• Skunk Creek Mapping Update</li> <li>• Update on Wastewater and Stormwater Collection System Master Plans</li> <li>• Preliminary Capital Improvements Program update</li> <li>• Boulder Civic Area Update</li> <li>• Boulder Creek Mitigation Plan Update</li> </ul>	
<b>Adjournment</b>	<b>[10:31 p.m.]</b>
There being no further business to come before the Board at this time, by motion regularly adopted, the meeting was adjourned at <b>10:31p.m.</b>	
<b>Motion to adjourn by:</b> Johnson; <b>Seconded by:</b> Squillace	
<b>Motion Passes 4:0 (Lesley Smith absent)</b>	
<b>Date, Time, and Location of Next Meeting:</b>	
The next WRAB meeting will be <b>Monday, 18 May 2015 at 7:00 p.m.</b> , at the <b>City's Municipal Services Center, 5050 Pearl St., Boulder, CO 80301</b>	

APPROVED BY:

ATTESTED BY:

Board Chair

Board Secretary

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

*An audio recording of the full meeting for which these minutes are a summary, is available on the Water Resources Advisory Board web page.*

<https://bouldercolorado.gov/boards-commissions/water-resources-advisory-board-next-meeting-agenda-and-packet>

DRAFT

**CITY OF BOULDER, COLORADO  
BOARDS AND COMMISSIONS MEETING MINUTES**

<b>Name of Board / Commission:</b> Water Resources Advisory Board	
<b>Date of Meeting:</b> 18 May 2015	
<b>Contact Information of Person Preparing Minutes:</b> Andrea Flanagan 303.413.7372	
<b>Board Members Present:</b> Vicki Scharnhorst, Dan Johnson, Lesley Smith <b>Board Members Absent:</b> Ed Clancy, Mark Squillace	
<b>Staff Present:</b> Jeff Arthur, Director of Public Works for Utilities Joe Taddeucci, Water Resources Manager Bob Harberg, Principal Engineer Douglas Sullivan, Acting Principal Engineer for Water, Wastewater and Stormwater Russ Sands, Watershed Sustainability & Outreach Supervisor Kurt Bauer, Engineering Project Manager Annie Noble, Flood and Greenways Engineering Program Coordinator Katie Knapp, Engineering Project Manager Kristin Dean, Utilities Planner Ken Baird, Utilities Financial Manager Andrea Flanagan, Board Secretary	
<b>Cooperating Agencies Present:</b> Craig Jacobson, Consultant with ICON Engineering, Inc. Alan Turner, Senior Project Manager, CH2M HILL Shea Thomas, Urban Drainage and Flood Control District	
<b>Meeting Type:</b> Regular	
<b>Agenda Item 1 – Call to Order</b>	<b>[7:00 p.m.]</b>
<b>Agenda Item 2 – Approval of the 27 April 2015 Meeting Minutes</b> <span style="float: right;"><b>[7:01 p.m.]</b></span>	
Motion to approve minutes from April 27 as presented. Vote: Tabled until a quorum is met (Ed Clancy & Mark Squillace absent; Leslie Smith absent at April 27 meeting.)	
<b>Agenda Item 3 – Public Participation and Comment</b>	<b>[7:02 p.m.]</b>
<b>Public Comment: None</b>	
<b>Agenda Item 4 –</b>	<b>[7:04 p.m.]</b>
<b>Public Hearing and Consideration of a Recommendation to City Council Regarding the Skunk Creek, Bluebell Canyon Creek and King’s Gulch Floodplain Mapping Update</b> Katie Knapp and Utilities staff presented the item to the board.	
<b>Executive Summary from the Packet Materials:</b>	
<b>Agenda Item 4 –</b>	<b>[7:04 p.m.]</b>
<b>Public Hearing and Consideration of a Recommendation to City Council Regarding the Skunk Creek, Bluebell Canyon Creek and King’s Gulch Floodplain Mapping Update</b> Katie Knapp and Utilities staff presented the item to the board.	
<b>Executive Summary from the Packet Materials:</b> Floodplain mapping provides the basis for flood management by identifying the areas at the highest risk of flooding. This information is essential for determining areas where life safety is threatened and property damage is likely and is the basis for floodplain regulations and the National Flood Insurance Program (NFIP). The city’s floodplain maps need to be periodically updated to reflect changes in the floodplain resulting from land development, flood mitigation improvements, new topographic mapping information and new mapping study technologies.	
The Skunk Creek Floodplain Mapping Update includes the King’s Gulch, Skunk and Bluebell Canyon Creek floodplains between the city limits to east of Foothills Parkway where Skunk Creek confluences into Bear Canyon Creek.	

Engineering consultants provided hydraulic modeling to update the existing Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) and City of Boulder floodplains, water surface elevations, conveyance and high hazard zones.

Engineering consultants provided hydraulic modeling to update the existing Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) and City of Boulder floodplains, water surface elevations, conveyance and high hazard zones.

The proposed mapping of the Skunk Creek Floodplain would result in a net:

- Increase of 38 structures identified in the 100-year floodplain;
- Decrease of 22 structures identified in the conveyance zone and;
- Decrease of 19 structures identified in the high hazard zone.

**WRAB Discussion Included:**

- Question about ICON report. Stated there seems that there were a lot of comments about inconsistencies in the report.
- Request for further clarification regarding Anderson report, not quite understood what “approximate studies” means in the peer review summary of this report.
- Question regarding additional hydraulic modeling regarding software for culvert analysis program.
- Question regarding the difference in the number of structures that were in the floodplain.
- Question regarding adjustments done by ICON and if there were differences in the information after the peer review.
- Question about grade changes on Mariposa and how they didn’t quite fit with comments about how much the flood event actually moved.
- Question about whether the peer-reviewed comments made by ICON have been reviewed by Anderson in order to help answer questions proposed by community?

**Public Comment:**

**Christina Jurgens**

Concerned that too much of the water from Bluebell Canyon Creek is mapped that it flowed down Columbine, rather than where it was actually observed during flood. Concern that there are errors in proposed flood map that misrepresent the risk to her property and possibly other properties. Regarding item 53, which points out in the peer review that flood maps need to follow topography, question of syntheses of two kinds of mapping and worried about errors in representation of potential risk. Worried that proposed map represents inaccuracies that present risk. Residents have not heard of any structures that were flooded in this particular section. Asks why the proposed floods from Bluebell Canyon Creek to Mariposa, from 16<sup>th</sup> to 17<sup>th</sup> smaller than the northward flows at 18<sup>th</sup> and 19<sup>th</sup>? Seems by looking at it, they should be more similar to each other. Feels this is a mistake. What method was used to determine the split at 20<sup>th</sup> and Columbine?

**Beth Robinson**

Noticed big difference this time in the conveyance zone on her block. Several people are constructing drainage pipes from the back conveyance zones to the front of the street from the easement at the back of the property. This will impact at least one property owner on the block, who is not able to rebuild without extensive regrading.

**Kris Miller**

Home has been in 100-year flood zone since moved in 2006 and has contacted the city multiple times to state that they should not be. Was told by city that all studies were approximate at that time and no official mapping was done. Was told in 2012 that a “real study” would be conducted and in April 2013, was informed by city that they were going to be taken out of the flood zone with this study, but it is a long process. She and neighbor were not flooded during the 2013 event. Lives on the corner and the flood jumped the banks and flooded south on Mariposa instead and flood didn’t even go near her property. When she called again, she was told that she was still in the floodplain. Concerned about the study. The flood actually occurred south of her property. Would like to know what happened and why she is still in the flood zone when the flood didn’t affect her property?

**R. Chris Roark**

Asked whether it was taken into account that there is a bridge at lower McClintock that significantly diverted water during the flood event, which washed out and ended up on his property. Bridge is no longer there and is not going to be replaced. Will this be considered in the flood mapping?

**Ali Yager**

Lives at the corner of 20<sup>th</sup> and Mariposa. All the water at 15<sup>th</sup> came down Mariposa and wants to know what the city can or should do to deal with the water that jumps onto Mariposa? Maintenance of Bluebell Creek between Mariposa and Columbine, which theoretically is where the water should go. Question is about maintenance of the systems that should be carrying water, which are not working properly.

**Motion by:** Scharnhorst; **Seconded by:** Johnson

**Vote:** 3:0 (Ed Clancy, Mark Squillace absent)

**Motion Passes as amended**

Staff requests Water Resources Advisory Board consideration of this matter and action in the form of the following motion:

**Based upon concurrence from Anderson regarding ICON’s responses to the peer review, we move to recommend that City Council adopt the Skunk Creek, Bluebell Canyon Creek and King’s Gulch floodplain mapping update.**

**Agenda Item 5 -**

**[7:42 p.m.]**

**Public Hearing and Consideration of a Recommendation to City Council Regarding the South Boulder Creek Floodplain Mitigation Plan**

Kristin Dean, Kurt Bauer and Utilities staff presented the item to the board.

**Executive Summary from the Packet Materials:**

A Recommended Plan for flood mitigation along South Boulder Creek was presented to the public, Water Resources Advisory Board (WRAB), Open Space Board of Trustees (OSBT) and City Council at a Study Session in 2014. The Recommended Plan was comprised of three phases:

- Phase I: Regional detention facility at US 36;
- Phase II: West Valley improvements; and,
- Phase III: Arapahoe Avenue detention.

In 2014, the WRAB and City Council were generally supportive of the mitigation proposed under Phases II and III. The OSBT also indicated their support for Phases II and III as it was not seen to have effects on city open space properties. However, significant concern was voiced by both boards and by City Council regarding potential environmental impacts, including those to Open Space and Mountain Parks (OSMP) lands from the proposed US 36 regional stormwater detention facility (Phase I). As a result, staff was directed to evaluate other options, including potential use of a larger portion of the University of Colorado’s CU South property to shift impacts away from environmentally sensitive areas.

Since then, six additional options were developed for US 36 detention, all designed to prevent the overtopping of US 36 during a 100-year design storm and reduce flooding impacts downstream and each with fewer impacts to OSMP than the original proposal. This memorandum presents the US 36 regional detention options, a comparison of potential impacts to OSMP and CU lands and a summary of potential next steps. Staff is recommending that the Phases II and III concepts remain unchanged in the mitigation master plan and that Phase I be accomplished using Colorado Department of Transportation (CDOT) Right of Way (ROW) and CU Campus South (Option D) for construction of a regional stormwater detention facility at US 36. In this alternative, the berm would be located within the existing CDOT right of way, and, with the exception of potential temporary impacts from construction of the berm, OSMP lands would only be affected when stormwaters are retained. Each of the additional options have a greater impact on CU’s land than the plan that was presented in 2014. However, while CU prefers the 2014 plan, they have also indicated they are willing to discuss use of their land to facilitate the implementation of Option D for regional detention.

**WRAB Discussion Included:**

- Question about cost estimates of property acquisition and property access rights and if they are included in the study?
- Statement that this seems to be a lot of embankment, which probably makes for significant cost relative to storage.
- Questioned how many acre feet is the storage for the proposed alternative and what are differences between the options?
- Stated that most of the concerns were about open space and possibly may hit a brick wall. Stated that pleased with the many options that came forward and that the resources were protected.
- Questioned if counts were taken of population of prebble mice in open space?
- Questioned how option D compares to the flood event in 2013?
- Commented that pleased with the engagement between CU and the city to discuss this topic.
- Stated that option D will require working with CU and CDOT. Asks what next steps are after voting on this item.
- Asked about timeline for CEAP projects?
- Asked for more information about liability concerns presented by public comment.
- Questioned level of confidence by staff that option D can be successful in the environmental planning process.

**Public Comment:****Pete Palmer**

Retired professor of geology and has lived in Boulder for almost 35 years. As an earth scientist, he recognizes global warming and the associated increase in the frequency of extreme weather events. As global temperatures rise, so does probability of these extreme weather events. Entering El Nino period, where warming is a known consequence. Likelihood of repeat of 2013 flood event is significantly higher than the 100-year to 500-year events anticipated in earlier planning. Supports South Boulder Creek Action Group and urges that we speed up Highway 36 flood mitigation efforts.

**Karl Anuta**

Map is disarming, appears that Cherryvale area is really bad, but what is really bad is Foothills Parkway. Represents Frasier Meadows residents and again asks that Board support some kind of flood retention system south of US 36. Option D appears to be really good. Lives must be considered. Very concerned about the process taking 5 years, which will worry residents for another 5 years. Urges that we move ahead as fast as possible and please ask City Council to do the same.

**Dick Leupold**

President of Resident Council for Frasier Meadows Retirement Community. Supports efforts to add berm to south side of US 36 to keep flood waters out of neighborhood. Wife was pushed through 2 feet of mud in her wheelchair during flood event. If it weren't for a series of miraculous events that night, there might not have been such positive outcome. People would have drowned in parking garage. Fortunate that no fatalities occurred. Encourages Board to approve the South Boulder Creek Action Group's motion to build a structure to prevent this from occurring in the future. Asks residents of Frasier Meadows to stand in support of his message (which they did).

**Bob Ritzen**

Director of Care at Frasier Meadows. Series of miraculous events happened that day. Flooding happened in the afternoon and staff stayed to assist. Evacuated skilled nursing area, which housed memory care residents, many of whom have low beds. Water rose quickly in this area and residents were evacuated very quickly. Staff and others pulled together to move residents to safety, without injuries. Residents move there thinking they are secure. Recent visitor from disaster relief visited and asked how many residents died after the event. Encourages as much haste as possible from the Board to make a decision for flood mitigation. Does not want to worry about the safety of residents every time it rains.

**Peter Baston**

Company runs programs for large insurance companies that insure projects like this. Spoke with CDOT and asked what mitigation upgrades are being proposed for US 36, without which Boulder cannot be a resilient city? Was told that it was going to be left up to the City of Boulder on the South Boulder Creek

Project, which means that CDOT has dumped liability on the city. If anything happens with any flood mitigation, the city will be held liable. Encourages as part of due diligence to understand the liabilities involved in what is being accepted and how this affects the city's resiliency.

**Jeff McWhirter**

President of Southeast Boulder Neighborhood Association. Ironic that his community did not get hit as badly as Frasier Meadows. Lucky in that respect. South Boulder Creek did not overtop, just many sewage back-up issues. Should be noted that this is not even the big 100-year flood. This was unique because there were 36 hours of notice. Also concerned with long-term impacts. Supports overall mitigation efforts. Continues to bring up questions about west valley improvements. What is going to happen with the piping of dry creek ditch and detention pond? Under impression that specific details of the plan will be considered during this EAP. Wants to make sure that everyone is on the same plan as we move into the future.

**Tim Johnson**

CEO at Frasier meadows. Can't speak to how many Prebble (mice) lives were lost. Can speak to lives that were not lost at Frasier. Speaks to importance of human life, which he would love for the Board to talk about, along with the mice and plant life. Appreciates the Board listening to this community. Makes an emotional plea that any consideration be made be done so on an expedited time frame. Residents are living in fear of a repeat flood. Residents are concerned with recent rain events. Staff have been checking around the clock and have begun planning for evacuation, should the need arise. The thought of doing this for the next five years is beyond comprehension. For the sake and safety of Frasier and nearby residents, please act with dispatch.

**Rick Mahon**

Represents South Boulder Creek Action Group. Thanks staff for responding to 99% of these issues. States that the berm height is a non-issue. Life-safety factor is beyond measurable. CU is interested in alternatives. Please speed this along.

**Kathie Joyner**

With South Boulder Creek Action Group. Weather makes everyone very, very nervous. Everyone is on edge and worried that a future rain events are going to overtop US 36. Needs to know that the city is responsible for providing relief. Encourages Board to recommend to Council that we move forward as quickly as possible to ensure safety of all residents in the South Boulder Creek floodplain. Asks for a show of hands from all people in audience who concur with this type of recommendation.

**Steve Karakitsios**

The plan has been studied for so long and asks that a recommendation be made. "Analysis paralysis" is over and need to just move forward with a recommendation. Option D looks like the best resolution with CU and CDOT. Encourages Board to expedite as much as possible.

**David McGuire**

Impact potential for construction, encourages staff to compare scope and duration of impacts with some of the other impacts on Open Space. Not a very big difference. No one bought into the area knowing they were going to be flooded when homes were bought 30 years ago. Home wasn't mapped in until 2012. Water goes over US 36 and we need to figure out how to stop it as quickly as possible.

**Peter Ornstein**

Everyone on street experienced sanitary sewer backups. System was overcharged, mostly from water that was building up because of so much rain. The new proposal does deal with stormwater overflow predictions and does address the floodplain issues, but does not know if it addresses sanitary sewer system back-up issues that residents actually experienced. All systems were overcharged. Recommends that we move forward and take a hard look at sanitary system.

**Bob Matthias**

Echoes all comments from tonight. Based on meeting attended four years ago, he understood that the reason for flooding is due to the overtopping of US 36, which is caused by the fact that the cross section of the bridge is too small to retain flood waters. In the process of rebuilding US 36, why was the cross section of that bridge not increased? If they had done this, a lot of the damages could have been avoided during

this event.

**Kathleen Motylenski**

Speaks on behalf of South Boulder Creek Action Group. Videos and photos are available to show the level of damages. On September 13<sup>th</sup>, it went from a lot of rain to about 4 feet of water in 20 minutes. Flood sirens couldn't even be heard. Absolutely miraculous that no lives were lost. We can't let this happen twice. Appreciates all the studies and alternatives, but timing is critical. This can happen again in the coming months. Residents are scared. Encourages Board to forge ahead as soon as possible.

**Terri Walters**

Thanks Board and staff for working really hard with all the competing issues. This situation is terrifying. Lives with family in a home that is dead in the way of the flood path. Lost everything in 2013. River of rock went through home and ruined antique furniture. This was a 50-year event. Could only afford to rebuild a structure about half the size. Please hurry.

**Motion by:** Smith; **Seconded by:** Scharnhorst

**Vote:** 3:0 (Ed Clancy, Mark Squillace absent)

**Motion Passes as presented**

Staff requests Water Resources Advisory Board consideration of this matter and recommends action in the form of the following motion:

**Motion to recommend that City Council accept the South Boulder Creek Major Drainageway Flood Mitigation Plan including Option D (single berm using Colorado Department of Transportation (CDOT) Right of Way) for 'Regional Detention at US 36' along with the Downstream Improvements as the recommended comprehensive alternative to mitigate flood risks associated with South Boulder Creek.**

**Agenda Item 6 –**

**[9:00 p.m.]**

**Information Item – Preliminary Capital Improvements Program**

**Ken Baird, Joe Taddeucci, Douglas Sullivan and other Utilities staff presented the information item to the board.**

As part of the city's annual budget process, Utilities develops a six-year planning budget, this year for the time period of 2016 through 2021. The Water Resources Advisory Board (WRAB) role in this process is defined in the Boulder Revised Code: “. . . to review all environmental assessments and capital improvements conducted or proposed by the utilities division.” Utilities staff has formulated initial revenue and expenditure projections for each of the three utility funds through the year 2021. Within the budget process, City Council approves and appropriates funds only for the first year, 2016.

WRAB will be asked to make a recommendation to City Council regarding the 2016-2021 CIP at its June meeting. The Planning Board will review the complete city CIP, including utilities, in July. City Council will discuss the CIP in August at a study session, and the overall budget is scheduled to be adopted by City Council in October.

**WRAB Discussion Included:**

- Requested that presentation slides be sent to Board for further review.
- Asked about areas that are underserved and if there is a way to add a storm drainage system there, which would require ripping up streets?
- Asked if feedback was provided from open houses regarding rate study increases?
- Asked about potential to save revenue based on the fact that we pay \$300 an acre foot whether it is used or not?
- Asked for clarification on outcome goal of the rate study and whether or not it would be revenue neutral, positive, or negative?
- Asked if there would be some benefit to having a revenue generating rate structure change?
- Requested additional information about financial reserves and how it is programmed.
- Asked if staff have received an increased volume of calls by residents since the rate increase

proposal?	
<b>Agenda Item 8 – Matters from the Board:</b> <b>Board Member Smith brought up the below matter(s):</b> <ul style="list-style-type: none"> <li>• Acknowledges that residents are traumatized by the 2013 flood event.</li> <li>• Asks if there is anything further the city can do to reduce the level of anxiety that residents feel with future weather events?</li> </ul> <b>Board Member Scharnhorst brought up the below matter(s):</b> <ul style="list-style-type: none"> <li>• Asked if there are any plans for the next few days’ impending storms.</li> </ul> <b>Board Member Johnson brought up the below matter(s):</b> <ul style="list-style-type: none"> <li>• Asked what we are doing as of result of the 2013 flood event? Concerned with rising creeks during recent rain events.</li> <li>• Requested confirmation about length of interceptor pipe.</li> </ul>	<b>[9:54 p.m.]</b>
<b>Agenda Item 8 – Matters from Staff:</b> <ul style="list-style-type: none"> <li>• Boulder Civic Area Update</li> <li>• Boulder Creek Mitigation Plan</li> <li>• GAC (Greenways) CIP</li> <li>• Bob Harberg presented a history book to the Board about Boulder’s Wastewater, written by Silvia Pettem.</li> </ul>	<b>[10:00 p.m.]</b>
<b>Agenda Item 9 – Future Schedule</b> <ul style="list-style-type: none"> <li>• Recommendation on 2016 Capital Improvements Program (CIP)</li> <li>• Recommendation on Rate Study Guiding Principles</li> </ul>	<b>[10:15 p.m.]</b>
<b>Adjournment</b> There being no further business to come before the Board at this time, by motion regularly adopted, the meeting was adjourned at <b>10:16 p.m.</b> <b>Motion to adjourn by:</b> Smith; <b>Seconded by:</b> Johnson <b>Motion Passes 3:0</b> (Ed Clancy & Mark Squillace absent)	<b>[10:16 p.m.]</b>
<b>Date, Time, and Location of Next Meeting:</b> The next WRAB meeting will be <b>Monday, 22 June 2015 at 7:00 p.m.</b> , at the <b>City's Municipal Services Center, 5050 Pearl St., Boulder, CO 80301</b>	

APPROVED BY:

\_\_\_\_\_

Board Chair

\_\_\_\_\_

Date

ATTESTED BY:

\_\_\_\_\_

Board Secretary

\_\_\_\_\_

Date

*An audio recording of the full meeting for which these minutes are a summary, is available on the Water Resources Advisory Board web page.*

<https://bouldercolorado.gov/boards-commissions/water-resources-advisory-board-next-meeting-agenda-and-packet>

**CITY OF BOULDER, COLORADO  
BOARDS AND COMMISSIONS MEETING MINUTES**

<b>Name of Board / Commission:</b> Water Resources Advisory Board	
<b>Date of Meeting:</b> 22 June 2015	
<b>Contact Information of Person Preparing Minutes:</b> Laurel Olsen-Horen 303-441-3203	
<b>Board Members Present:</b> Vicki Scharnhorst, Lesley Smith, Ed Clancy <b>Board Members Absent:</b> Mark Squillace, Dan Johnson	
<b>Staff Present:</b> Jeff Arthur, Director of Public Works for Utilities Joe Taddeucci, Water Resources Manager Bret Linenfelser, Water Quality & Environmental Services Manager Ken Baird, Utilities Financial Manager Russ Sands, Watershed Sustainability & Outreach Supervisor Joanna Bloom, Source Water Administrator Annie Noble, Acting Principal Engineer for Flood and Greenways Eric M. Ameigh, Public Works Projects Coordinator Douglas Sullivan, Acting Principal Engineer for Water, Wastewater and Stormwater Laurel Olsen-Horen, Board Secretary	
<b>Meeting Type:</b> Regular	
<b>Agenda Item 1 – Call to Order</b>	<b>[7:00 p.m.]</b>
<b>Agenda Item 2 – Approval of the 27 April &amp; 18 May 2015 Meeting Minutes</b>	<b>[7:01 p.m.]</b>
A motion to approve the minutes from the 27 April & 18 May meetings was tabled as the present board members do not make a quorum for approval.	
<b>Agenda Item 3 – Public Participation and Comment</b>	<b>[7:02 p.m.]</b>
<b>Public Comment:</b> None	
<b>Agenda Item 4 –</b>	<b>[7:02 p.m.]</b>
<b>Public Hearing and Consideration of a Recommendation to City Council Regarding 2016 Utilities (Water, Wastewater, and Stormwater/Flood Management) 6-year Capital Improvement Program (CIP)</b>	
Ken Baird and Utilities staff presented the item to the board.	
<b>Executive Summary from the Packet Materials:</b>	
As part of the city’s annual budget process, Utilities staff develops a six-year planning budget, this year for the time period of 2016 through 2021. The Water Resources Advisory Board (WRAB) role in this process is defined in the Boulder Revised Code: “. . . to review all environmental assessments and capital improvements conducted or proposed by the utilities division.” Utilities staff has formulated revenue and expenditure projections for each of the three utility funds through the year 2021. Within the budget process council approves and appropriates funds only for the first year, 2016.	
At the April 27 and May 18, 2015 WRAB meetings, staff presented the preliminary 2016 Utilities budget including the six-year capital improvement program. Since the May 18 meeting, the following change within the Water Utility CIP has been incorporated into the Capital budget: \$150,000 was added in 2016 for the Boulder Reservoir Water Treatment Facility for replacement of failing filter valve actuators.	
Staff requests a recommendation from the WRAB concerning the 2016 Utilities Budget including the 6 year Capital Improvement Program (CIP) and associated Monthly Utility Rates. Staff will submit the CIP to the Planning Board which will meet to discuss the citywide CIP and make a recommendation to City Council on August 6. City Council study sessions are scheduled for August 11, 2015 concerning the proposed city-wide 2016-2021 CIP and on September 8 and September 22 on the preliminary 2016 city wide budget. City Council is scheduled to hold first and second readings on adoption of the budget on October 6 and October 20 respectively.	
<b>STAFF RECOMMENDATION:</b>	
Staff recommends that WRAB make the following motion related to the 2016-2021 CIP:	

The Water Resources Advisory Board recommends approval of the 2016-2021 CIP for the Water, Wastewater, and Flood/Stormwater Utilities including proposed rate adjustments to support 2016 revenue increases of 8% in the water utility, 5% in the wastewater utility, and 4% in the stormwater and flood control utility.

**WRAB Discussion Included:**

- Clarifying questions on how line items provided in the memo are planned to be funded with the proposed rate adjustments.

**Public Comment:**

None

**Motion by:** Clancy; **Seconded by:** Smith

**Vote:** 3:0 (Board members Squillace and Johnson absent)

**Motion Passes as presented**

**Agenda Item 5 -  
p.m.]**

[7:22

**Public Hearing and Consideration of a Motion Regarding the Utility Rates Study Guiding Principles, Issues, and Key Questions**

Eric Ameigh, Joanna Bloom and Utilities staff presented the item to the board.

**Executive Summary from the Packet Materials:**

**PURPOSE**

The purpose of this item is to secure a recommendation from the Water Resources Advisory Board (WRAB) on the issues, key questions, guiding principles, and work plan for the utility rates study.

**QUESTIONS FOR THE BOARD**

1. What questions does WRAB have about the public engagement process?
2. What feedback does WRAB have on the recommended guiding principles?
3. What feedback does WRAB have on the potential areas of study?

**BACKGROUND**

In late 2014, Utilities staff met with customers to better understand the impacts of utility rate increases approved by council in the fall of 2014. Many customers indicated they did not understand utility rate structures and/or had questions and concerns about the calculation of the charges on their utility bills. It is also best practice to periodically review rate setting methodology to assure the rates are meeting community goals and are aligned with fee-based principles. These findings led staff to propose evaluation of the rate structure and associated calculations for water, wastewater, and stormwater/flood management utilities as part of the 2015 work plan. As a first step, a public engagement process was implemented to solicit broader feedback across all customer classes.

**WRAB Discussion Included:**

- What are the next steps to get more public engagement? Staff recognizes the need to garner more public input; but are not clear at this time what that will look like.
- Focus Groups have proven to be affective.
- Clarification of what “onsite management” for stormwater means. Perhaps rephrase using low impact development language.
- Importance of being proactive rather than reactive in our guiding principles.
- Necessity to meet regulations efficiently, affordably, and timely, and not pursue unnecessary research and development. R & D should not have a place in the guiding principles – it can be extremely costly to rate payers. (There is a cost to meeting regulations and there is a cost to exceeding regulations.)
- Balance the above statement with taking pride in some of the studies the city has already done and received invaluable information from. Boulder is advantageously positioned to gather information as a first water recipient.

- Has the city done a study where we look at a utility customer's water budget and see how they are using it? The city's information is anecdotal. One question on the table for the board is; should the city pursue gathering more detailed information?
- Are there any best practices from peer communities Boulder could look into?
- The city should implement a two-meter system; a water budget and a landscaping budget.
- Investigate whether water budgets should be reduced to take into account the installation of more water efficient appliances within the community since water budgets were implemented.
- Would flood insurance holding status play a role into the city's study?
- "Resilience" and "Sustainability" need to be included in the guiding principles.

**Public Comment:**

**Chuck Howe:** There seems to be more opportunities available to CII water customer class than to single-families. Fraiser Meadows has seven different meters and have found the water budget classes very useful to help track how water is being used. A water bill is comprised mostly of fixed charges rather than volumetric charges which seems odd. Conservation is therefore not incentivized. There is no charge for the city's raw water on a utility bill and there is a missed opportunity cost with this system and therefore the city is under-charging for water.

**Motion by:** Smith; **Seconded by:** Clancy

**Vote:** 3:0 (Board members Squillace and Johnson absent)

**Motion:** The Water Resources Advisory Board recommends that the Guiding Principles and Areas of Study, as discussed and organized with the appropriate edits to the documents titled "Guiding Principles Summary Table" and "Areas of Study," be utilized for the 2015-2016 Utility Rates Study

**STAFF RECOMMENDATION**

Staff recommends that WRAB discuss and vote on one or more motions that support:

1. A recommended set of utility rate structure guiding principles; and
2. A recommended draft plan of work for studying key questions and issues.

**Agenda Item 6 – Matters from Board:** [9:12 p.m.]

- Timeline for filing WRAB vacancy
- How is the Greenways program with June being Bike Month?
- What is the flood potential with warm weather in the forecast?

**Matters from Staff:** [9:15 p.m.]

- None

**Agenda Item 7 – Future Schedule** [9:15 p.m.]

Upcoming meetings will consist of information items such as the following:

- Pre and Post Fire Watershed Planning
- Stormwater Collection System Permit and Regulation Changes
- Wastewater Treatment Update
- Update on Wastewater and Stormwater Collection System Master Plans

**Adjournment** [9:20 p.m.]

There being no further business to come before the Board at this time, by motion regularly adopted, the meeting was adjourned at 9:20 p.m.

**Motion to adjourn by:** Smith; **Seconded by:** Clancy

**Motion Passes 3:0**

**Date, Time, and Location of Next Meeting:**

The next WRAB meeting will be **Monday, 20 July 2015 at 7:00 p.m.**, at the **City's Municipal Services Center, 5050 Pearl St., Boulder, CO 80301**

APPROVED BY:

\_\_\_\_\_  
Board Chair

\_\_\_\_\_  
Date

ATTESTED BY:

\_\_\_\_\_  
Board Secretary

\_\_\_\_\_  
Date

*An audio recording of the full meeting for which these minutes are a summary, is available on the Water Resources Advisory Board web page.*

<https://bouldercolorado.gov/boards-commissions/water-resources-advisory-board-next-meeting-agenda-and-packet>

DRAFT

**CITY OF BOULDER  
WATER RESOURCES ADVISORY BOARD  
AGENDA ITEM**

**MEETING DATE: July 20, 2015**

**AGENDA TITLE:** Information Item – Pre- and Post-Fire Watershed Planning Update

**PRESENTERS:** Jeff Arthur, Directory of Public Works for Utilities  
Bret Linenfelser, Water Quality and Environmental Services Manager  
Michelle Wind, Drinking Water Program Supervisor

**EXECUTIVE SUMMARY:**

The purpose of this memorandum is to update the Water Resources Advisory Board (WRAB) on the city's proactive efforts for pre- and post-wildfire planning, specifically related to protecting the city's water supply resources. Staff is not requesting any WRAB action at this time.

**BACKGROUND:**

The city's water supplies come from high elevation forested areas in the North and Middle Boulder Creek watersheds and from the Colorado-Big Thompson Project through Boulder Reservoir. Forest health and fires within these watersheds can significantly impact water quantity and quality. How wildfire may impact water quality and supply depends on wildfire extent and intensity, post wildfire precipitation, topography, and local soils and vegetation. Potential effects of wildfire on the city's water supplies, treatment facilities and downstream aquatic ecosystems can include changes in the amount and timing of snowmelt runoff; increased erosion and transport of sediment and debris; temporary system shutdowns; and increased loading of nutrients, natural organic matter, and metals. For example, if sediment and debris accumulated in the city's reservoirs following a wildfire, the city could experience serious treatment challenges, taste and odor issues, and a potential reduction in the city's usable water supplies.

In addition to fire suppression and impacts to environment and economy, wildfires can have direct and indirect associated costs to water quality and reliability that may include need for wildfire-related sediment and pollution controls and mitigation, degradation of municipal and hydropower supplies, system repairs, administrative costs, increased operation and maintenance, remediation, and long-term changes in water yield.

**Recent Watershed Fire History**

Characteristics of the city's drinking water supplies indicate they may have some protection from damaging forest fire, but fire is still a priority concern due to potential post-fire water supply and

quality impacts. Barker Reservoir and Lakewood Reservoir watersheds have some protection due to elevation, both above 8,000 feet, with more moisture and lower air temperatures. However, the 2012 Fern Lake fire area that burned approximately 3,500 acres in Rocky Mountain National Park, at approximately 8,000 to 11,000 feet, was higher than many of the recent fires in Northern Colorado and that area had not burned in more than 800 years. No damaging forest/wildfires have occurred within the Barker Reservoir or Lakewood Reservoir water supply watersheds over the last twenty years

Boulder Reservoir and the Boulder Feeder Canal supplies have mitigating factors of lower amounts of fire fuel, upstream dilution, settling, distance and limited watershed area below Lake Estes. The 2009 Olde Stage Fire, 2003 Overland Fire and the 2010 Four Mile Creek wildfires occurred within the Boulder Reservoir watershed but no water quality impacts were observed in Boulder Reservoir or the Boulder Feeder Canal. Attachment A includes a map showing the location of recent major wildland fires in Boulder County.

### **Initial Wildfire Planning Incorporating Water Supply**

The Colorado Front Range experienced major impacts on municipal water supplies in the past 15 to 20 years (e.g., 1996 Buffalo Creek Fire, 2002 Hayman Fire) and subsequent assessments concluded that climate factors and forest conditions place Front Range water supply watersheds at high risk from severe wildfires and erosion and flood damage to reservoirs. In 2007, the Colorado State Forest Service and the U.S. Forest Service hosted a meeting with Front Range water providers, and the Front Range Watershed Wildfire Protection Working Group was formed with a vision ‘to protect Colorado water supplies and critical infrastructure from catastrophic wildfire and other threats by maintaining healthy, resilient watersheds through collaboration, implementation, leveraging, and education.’ The city has been participating in this partnership effort that is still active. The working group developed a fire hazard assessment methodology and a prioritization process to evaluate mitigation potential for larger scale watersheds critical for public water supplies.

In 2010 and 2011, the city participated in an application of the assessment methodology for the Saint Vrain Watershed (i.e., the main streams that come together to form the Saint Vrain before the confluence with the South Platte River—Saint Vrain, Left Hand, Boulder, and Coal Creeks) developed through a stakeholder review process. The stakeholder group included representatives from water providers; federal, state and local land management agencies; counties; towns and other interested groups. The Saint Vrain Watershed assessment expanded upon existing wildfire hazard reduction efforts by including water supply watersheds as a community value. The analysis included wildfire hazard, flooding/debris flow hazard and soil erodibility, as well as incorporating opportunities and constraints to assist in determining where to pursue watershed protection/hazard reduction efforts. Factors for opportunities and constraints included land ownership, access, slopes, wilderness areas (restrictions), roadless areas, vegetation (fuel), See Attachment B for the Saint Vrain composite hazard ranking.

## ANALYSIS:

In 2013, the city contracted with JW Associates Inc., to refine the prioritization and hazard assessment for the smaller watersheds within the city's water supply system, incorporate water supply components, include opportunities and constraints to reducing wildfire hazard to water supplies, and collaborate with watershed stakeholders to develop a wildfire watershed protection plan. Goals of the project include facilitating preplanning (e.g., permitting debris/sediment structures to avoid missing the first season after a fire) and identifying priority areas for vegetation management before fire or targeted mitigation efforts after fire. This ongoing project includes the following phases:

- **Phase 1** (*completed in 2014*) – Small-scale Watershed Hazard Targeting Assessment and Prioritization
- **Phase 2** (*start in 2015*) – Develop a Pre- and Post-Wildfire Plan
  - Establish watershed/forest goals with stakeholders
  - Identify potential projects
  - Host public meetings

### Results of Phase 1 Small-scale Watershed Hazard Assessment and Prioritization

The small watersheds defined for the analysis included 43 small watersheds with approximately 65,000 acres (Attachment C). The analysis identified zones of concern that areas above surface water intakes and reservoirs (generally 5 miles upstream) and operational components (e.g., Betasso Water Treatment Facility, Boulder Canyon Hydro). The hazard ranking components included:

- Wildfire hazard (flame length, mountain pine beetle activity)
- Flooding/debris flow hazard (watershed steepness/ruggedness, road density)
- Soil erodibility and land slope

A composite hazard ranking numerically combined the rankings for each small watershed to help compare relative watershed hazards based solely on environmental factors. The Boulder Reservoir watershed and the small facility areas in Boulder Canyon ranked low to medium. Attachment C includes the composite hazard ranking for the higher elevation watersheds. The highest ranked composite hazards are:

Upper Middle Boulder Creek  
Middle North Boulder Creek  
Coon Track Creek  
Hicks Gulch

North Fork Middle Boulder Outlet  
Lower North Fork Middle Boulder  
Lower South Fork Middle Boulder  
Lower Middle Boulder Creek

The analysis also included an estimate for sediment transport to indicate areas where sediment is deposited (red) and where it continues to move downstream (green) (Attachment D).

The highest priority post-wildfire hazard risk for the city water supply is an area above Barker Reservoir. This area has lodge pole pine and aspen and open area that provide opportunity for

hazard reduction efforts. Though ranked with a lower hazard risk, Como Creek and Lakewood Reservoir watersheds have significant areas of lodge pole, as well as areas of opportunity to implement mitigation (e.g., public land, not steeply sloped). The Silver Lake Watershed does not have significant priority issues related to fire hazard.

## **Project Stakeholders**

Phase 1 also included a meeting of stakeholders to provide an opportunity to discuss the watershed analysis and identify common interests and issues. Stakeholders include:

- City of Boulder (Water Quality, Water Resources, Open Space and Mountain Parks)
- Boulder County (Land Use, Sherriff Office, Public Health, Parks and Open Space)
- Town of Nederland
- Eldora Mountain Resort
- Nederland Fire Protection District
- Colorado State Forest Service
- US Forest Service (Arapaho Roosevelt National Forest, Regional Office)

## **Other Ongoing Projects**

*Colorado-Big-Thompson Watershed.* Northern Water is working with other agencies to address [forest and watershed health](#). Activities include the Colorado-Big Thompson Headwaters Partnership with the U.S. Bureau of Reclamation, Colorado State Forest Service, and U.S. Forest Service to prioritize and implement forest fuel-related projects, monitoring water quality impacts from recent fires (e.g., Fern Lake Fire) and baseline monitoring of rainfall and runoff, and funding post-fire response (e.g., seeding, mulching, debris booms, sediment basins).

*Pre-Disaster Mitigation Program Grant – City of Boulder Water Utility Infrastructure.* The city is partnering with Boulder County on a Boulder County Wildfire Mitigation project funded through a Department of Homeland Security FEMA Pre-Disaster Mitigation grant. The project includes fuel reduction work (e.g., thinning tree stands) around the west side of the Betasso Water Treatment Facility, Boulder Canyon Hydro, and Kossler Reservoir. The city and county will cooperate on the work at the Betasso Water Treatment Facility, and the county will perform the work on its adjacent Betasso property. Work will be conducted in the winter of 2015 and 2016.

*Boulder Ranger District – South of Nederland and west of Gross Reservoir.* The [Forsythe project](#) is part of the Front Range Stewardship Project/Healthy Forest Initiative that has a 10-year contract for work to reduce forest fuel, and the threat to forest from mountain pine beetle. To date there have been large patch cuts in several locations south of Nederland and smaller projects in other areas such as along Sugarloaf Rd. Members of the public raised concerns regarding large patch cuts, and as a result subsequent patch cuts have been put on hold to resolve issues of public concern.

**NEXT STEPS:**

Phase 2 was initiated this year and will begin with a stakeholder watershed tour and more detailed vegetation mapping, and developing resilient watershed goals. The planning process will also include collaborative meetings with stakeholders to identify forest management and road projects, as well as public meetings before finalizing the plan.

**ATTACHMENTS:**

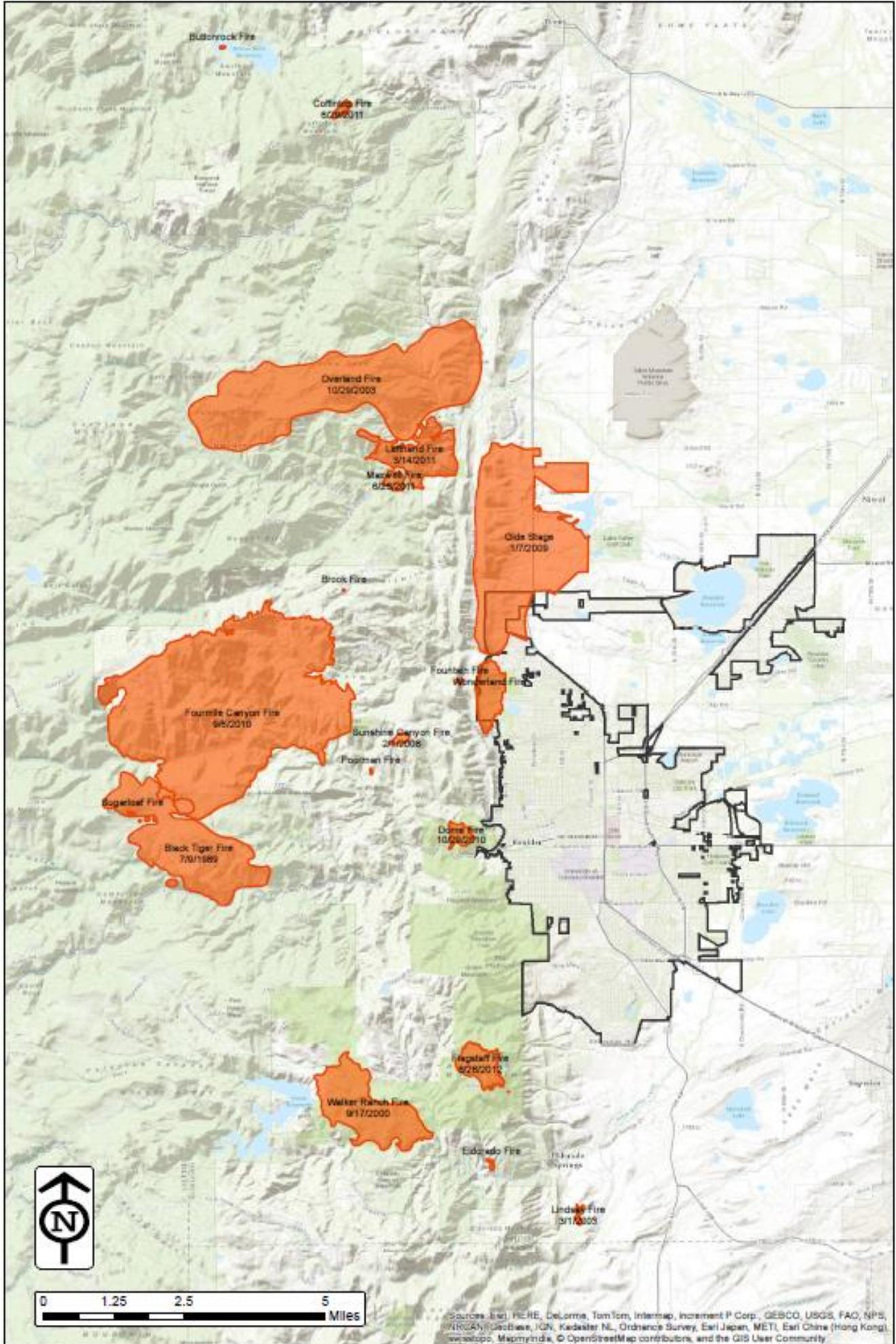
- A – Boulder Area Major Wildland Fires since 1989
- B – Saint Vrain Watershed Assessment Priority
- C – City of Boulder Small Watersheds Analysis
- D – Phase 1 Small Watershed Sediment Transport Assessment

# ATTACHMENT A BOULDER AREA MAJOR WILDLAND FIRES SINCE 1989

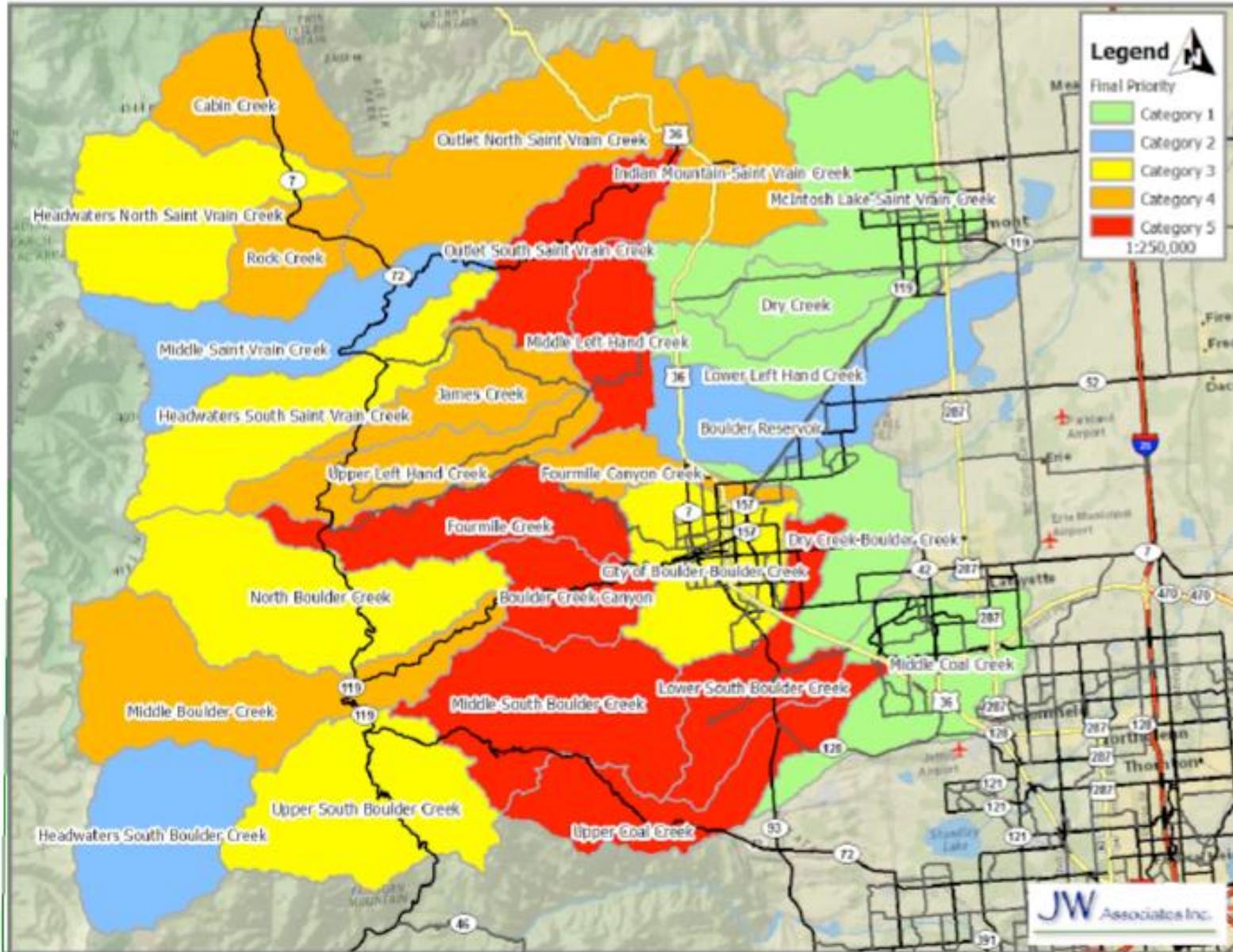
## Boulder Area Major Wildland Fires

Major Wildland Fires In Boulder County Colorado since 1989

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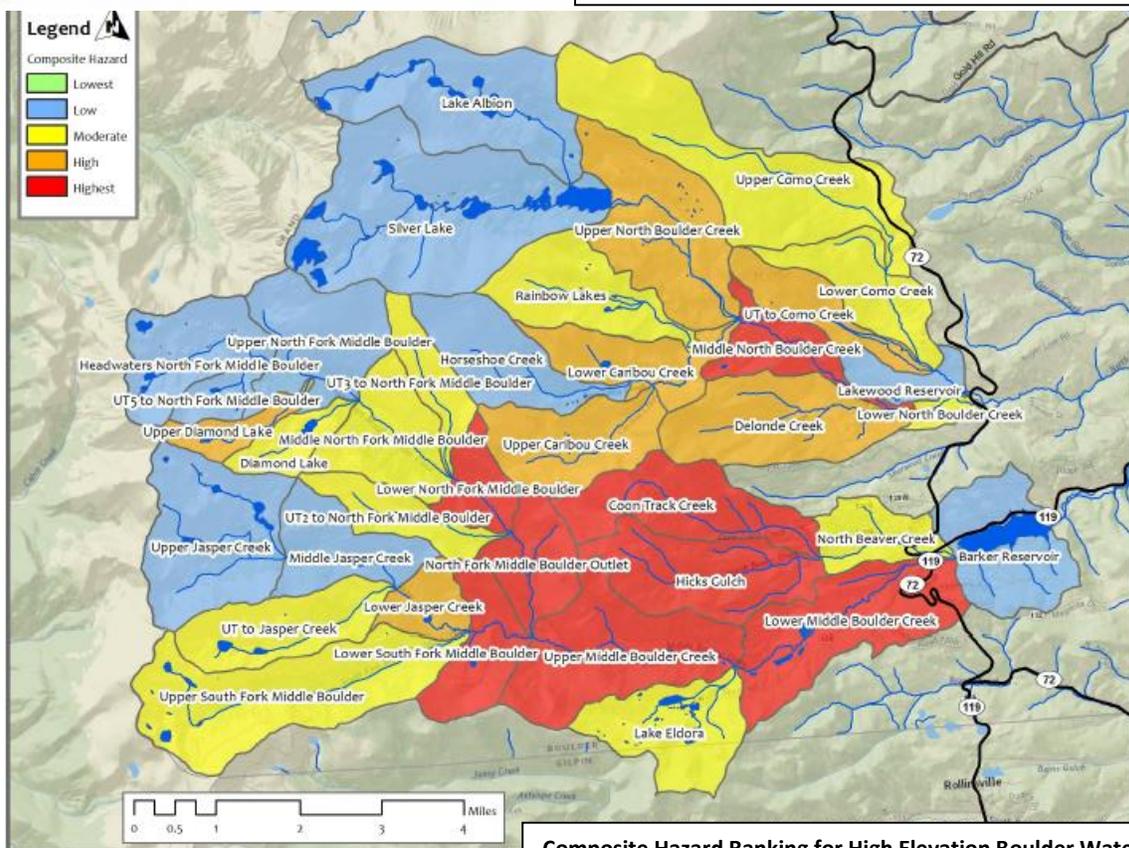
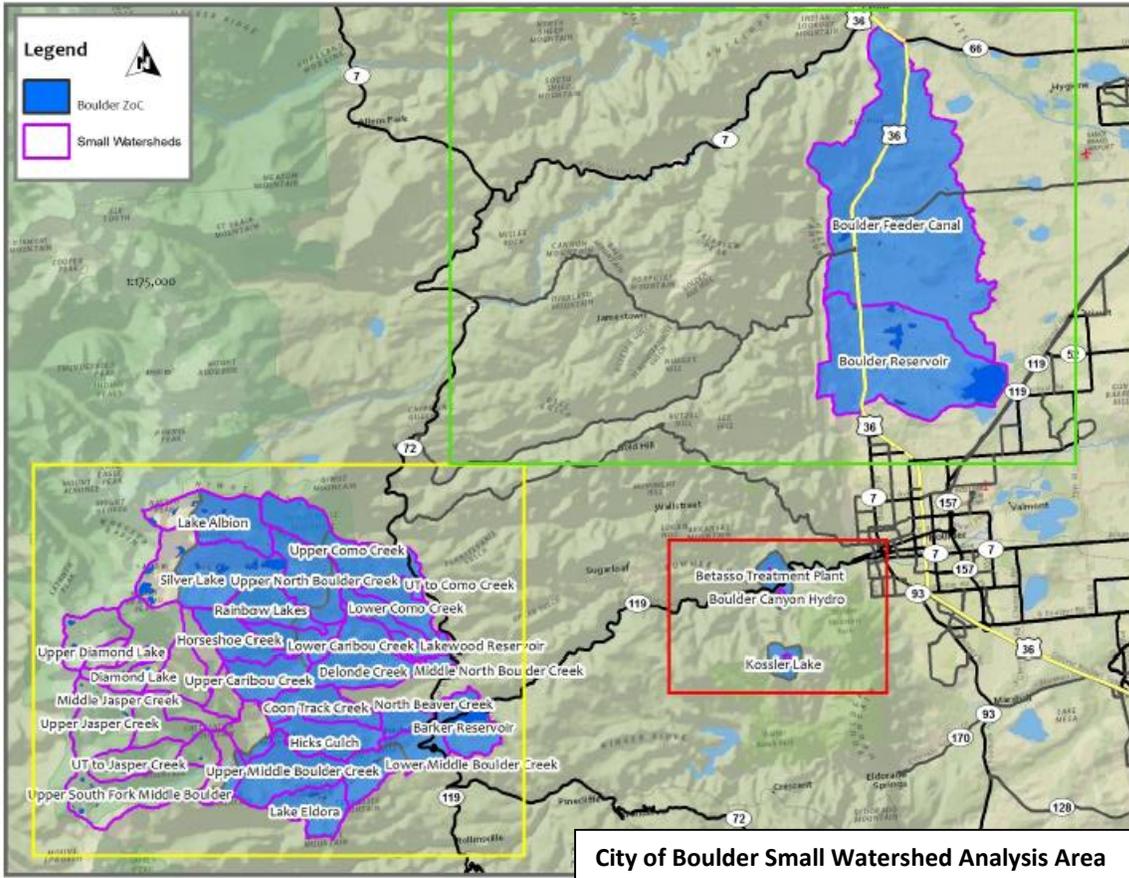


**ATTACHMENT B  
SAINT VRAIN WATERSHED ASSESSMENT PRIORITY**

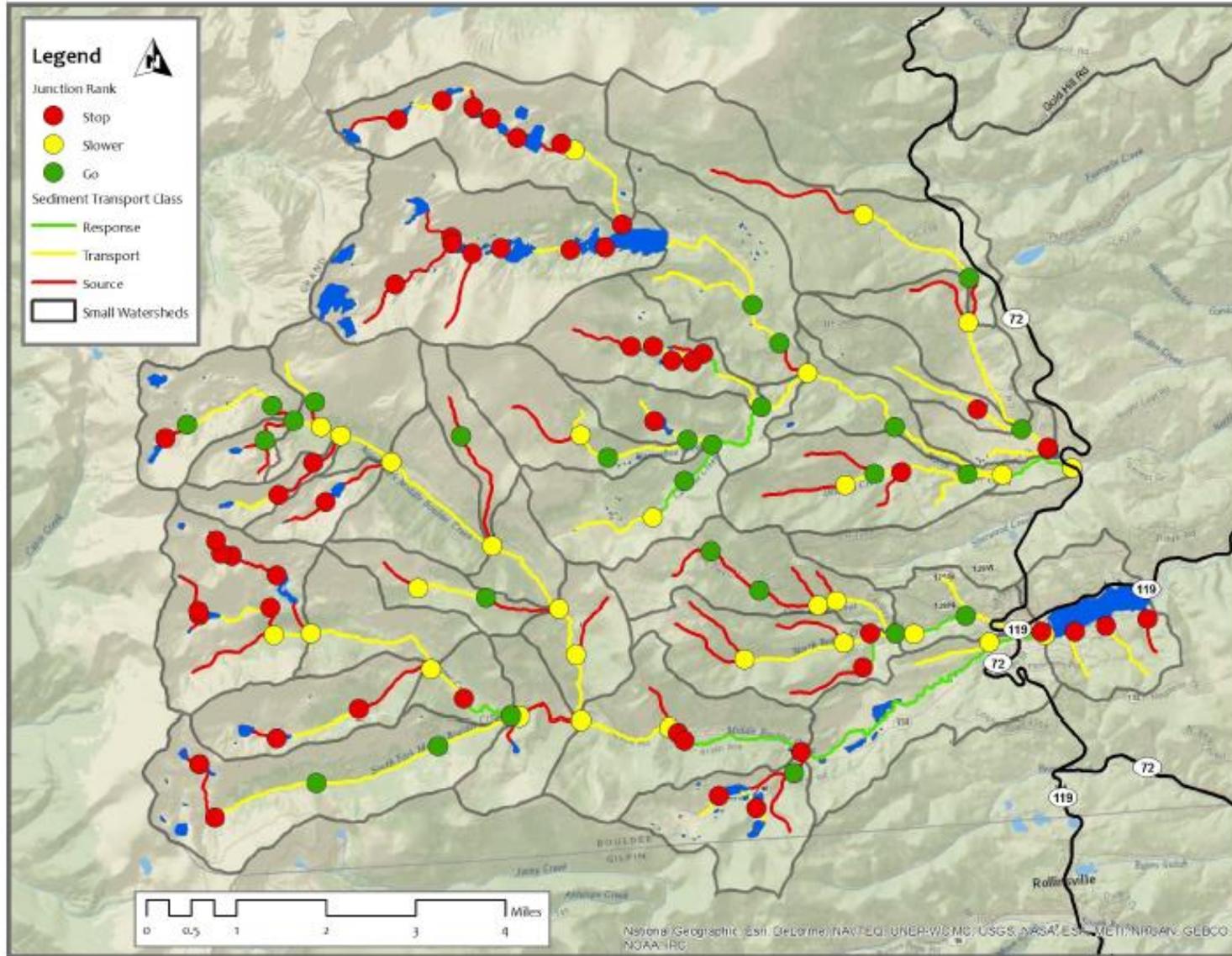


Category 1 – Lowest Hazard/Priority  
Category 5 – Highest Hazard/Priority

# ATTACHMENT C CITY OF BOULDER SMALL WATERSHEDS ANALYSIS



**ATTACHMENT D**  
**PHASE 1 SMALL WATERSHED SEDIMENT TRANSPORT ASSESSMENT FOR HIGH ELEVATION WATERSHEDS**



**CITY OF BOULDER  
WATER RESOURCES ADVISORY BOARD  
INFORMATION ITEM**

**MEETING DATE: July 20, 2015**

**AGENDA TITLE:** Information Item – Wastewater Treatment Update

**PRESENTERS:**

Jeff Arthur, Director of Public Works for Utilities  
Chris Douville, Wastewater Treatment Manager  
Douglas Sullivan, Acting Principal Engineer

**I. PURPOSE**

This information item provides an update on the wastewater treatment facility (WWTF) and related programs / projects. The memorandum is organized as follows:

1. Summary of facility status and recent performance
2. Nitrogen Upgrades Project
3. Other noteworthy Capital Improvement Project (CIP) efforts

Later in 2015, WRAB will learn of updates associated with two additional wastewater topics. These items are tentatively scheduled as follows:

- October 19 – **Wastewater Treatment Renewable Energy**. Topics to include cogeneration, solar PV, and energy management initiatives.
- November 16 – **Wastewater Facility Permit Renewal and Regulations Update**. Topics to include Colorado Discharge Permit System (CDPS) effluent permit renewal status, and regulatory updates on important parameters such as copper, arsenic, and temperature.

**II. SUMMARY OF FACILITY STATUS AND RECENT PERFORMANCE**

The 75<sup>th</sup> St. wastewater treatment facility (WWTF) is 47 years old yet continues to perform with a high degree of success due in large part to proper and timely investments over the years to address capacity, regulations, and aging infrastructure. 2014 was a so-called baseline year of performance as no construction activities occurred, and no major process or operational modifications were implemented. It is fair to say that 2014 was the best performance year the

WWTF has ever accomplished, based on effluent quality, permit compliance, and resource utilization.

Facility data from the past 18 months (January 2014 through June 2015) is summarized below in Table 1. Effluent quality was excellent during this timeframe, including ammonia removal which was particularly impressive. During this timeframe, there were no effluent concentration violations of the CDPS permit. However, in May 2015 Boulder experienced significant, steady precipitation that resulted in elevated levels of infiltration and inflow (I&I) entering the wastewater collection system. As a result, wastewater flows increased significantly, and a monthly average flow of 26 MGD occurred, which is above our permitted flow limit of 25 MGD.

**Table 1 – Effluent quality from January 2014 through June 2015**

<i>Parameter</i>	<i>Min</i>	<i>Ave</i>	<i>Max</i>	<i>Notes</i>
Flow (MGD)	9.2	15.6	39.9	Max month limit 25 MGD
cBOD (mg/L)	1	3	8	Monthly permit limit 25 mg/L
TSS (mg/L)	2.0	5.8	21	Monthly permit limit 30 mg/L
NH3 (mg/L)	<0.1	<0.1	0.9	Future permit low limit 1.9 mg/L
NO3 (mg/L)	6.6	14.2	22.9	Future permit low limit 14.7 mg/L
<i>E-Coli</i> (#/100 ml)	1	33*	365	Monthly permit limit 126 / 100ml

\* *E-coli* geometric mean is lower than arithmetic average.

Source energy use, and the distribution between grid electricity and renewables, is an important aspect of how treatment goals are achieved. Both reduction of grid energy reliance as well as conservation and using less energy are of high interest for the wastewater treatment program. Table 2 below summarizes the distribution between grid electricity, electricity provided by the city’s 29-year-old cogeneration facility, and electricity provided by the 5-year-old Solar PV facility (owned, operated, and maintained by SunEdison) for the most-recent 12 months.

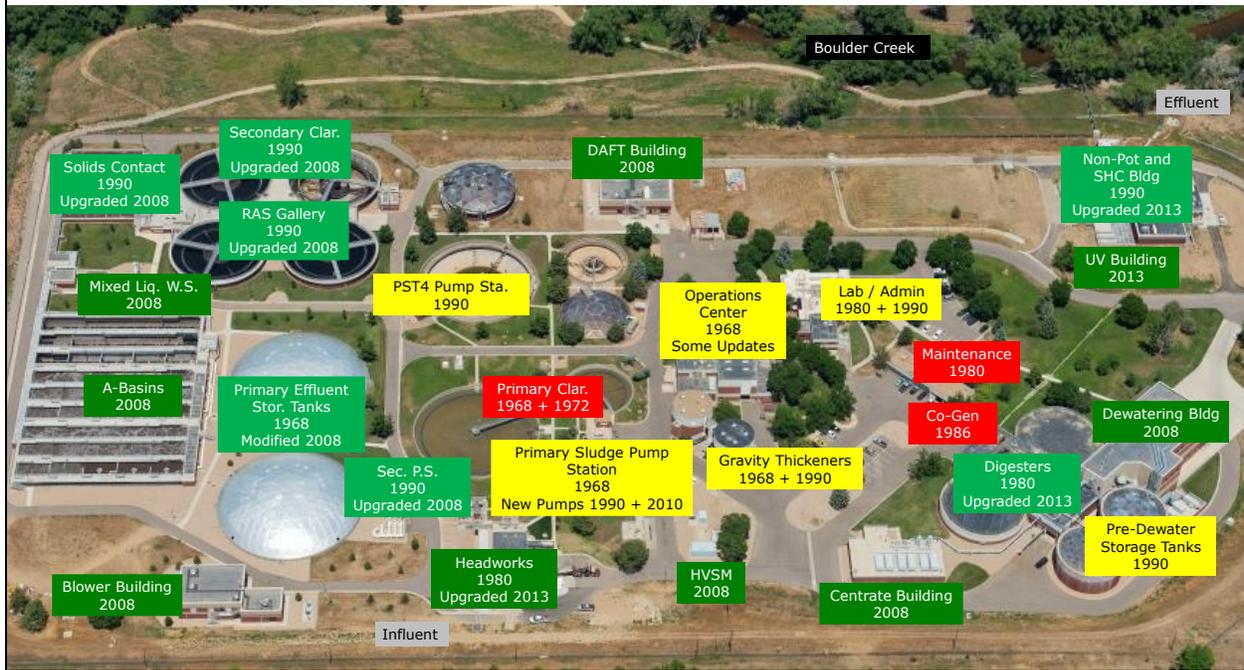
**Table 2 – Electrical power distribution summary, June 2014 through May 2015**

<i>Source</i>	<i>Percent</i>	<i>Notes</i>
Solar PV	13	15% during year 1
Cogeneration	18 *	Historically 20-25%
Niwot Substation Grid	15	
Leggett Substation Grid	54	
Grid Subtotal	69	
Renewables Subtotal	31	

\* Cogeneration production has been reduced lately due to multiple mechanical, electrical, and control issues resulting in higher than normal downtime.

Another ongoing program at the WWTF is analysis and decisions around asset management and replacement of aging infrastructure. Figure 1 below may provide a useful framework to understand the evolution and age of the various process areas and buildings / subsystems at the WWTF, and how much of the infrastructure is newer versus aged and at or beyond its useful life.

## City of Boulder 75<sup>th</sup> St. WWTF Age of Process Areas and Buildings



**Figure 1 – Age and Status of Process Areas and Buildings**

According to the most recent asset management inventory review, which factored into the 2016 CIP budget, the following major capital items budgeted for replacement in the near term:

- 2016 – Pumps - \$150,000 – repair or replacement of top priority pumps
- 2019 – Digester - \$200,000 – design services for new gas storage
- 2020 – Digester - \$2,000,000 – construction of new gas storage facility
- 2020 – Cogeneration - \$185,000 – mechanical overhaul of engines

### III. NITROGEN UPGRADES PROJECT

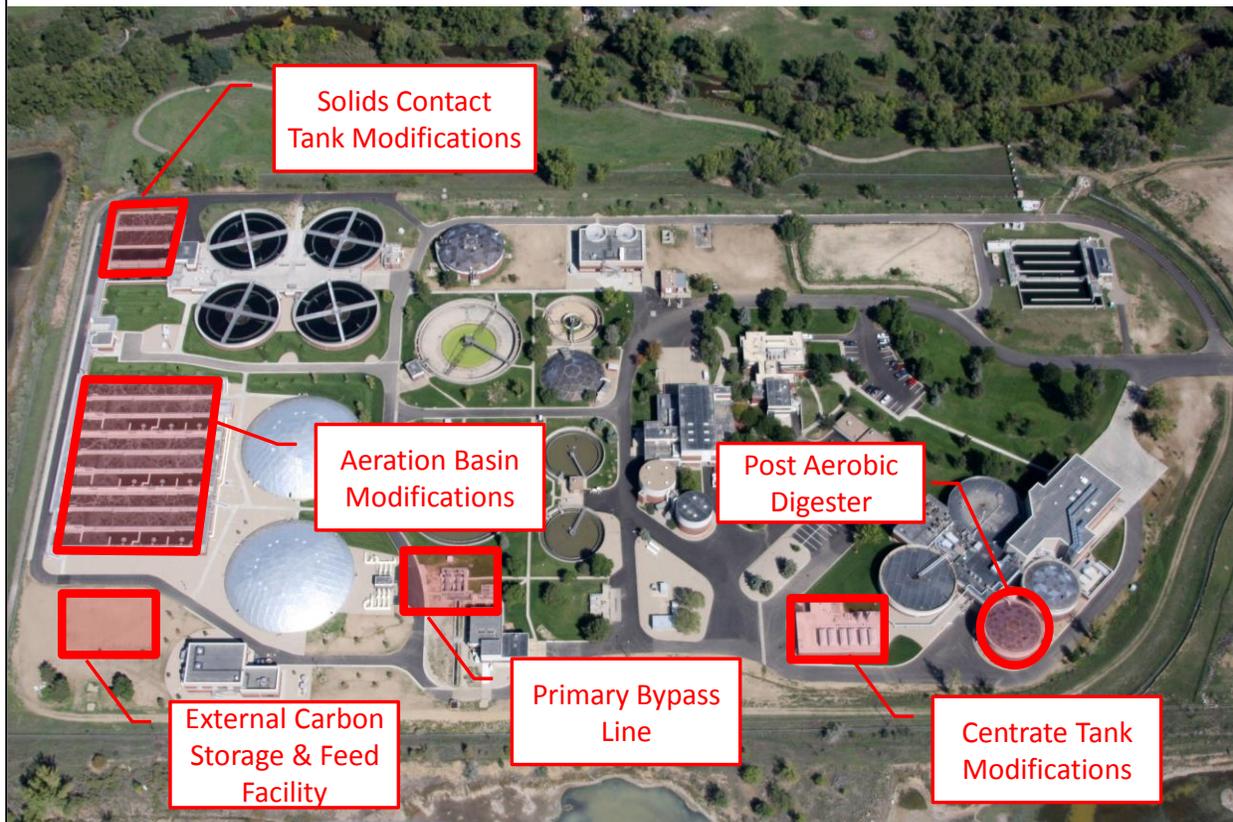
The Nitrogen Upgrades Project (NUP) is the first of three planned projects to meet nutrient regulations for nitrogen and phosphorus. The broad plan for regulatory compliance can be found in the Nutrient Compliance Study, shared with WRAB at the November 2012 meeting as an agenda item. (<https://documents.bouldercolorado.gov/weblink8/0/foi/58033/Row1.aspx>) The main goal of the NUP project is to achieve full compliance with Regulation 85 nitrogen, as well as daily maximum ammonia and nitrate limits that were included in the current CDPS permit (which goes into effect December 1, 2017). It is expected that Regulation 85 limits for nitrogen and phosphorus will be incorporated into the 2016 permit renewal and will include an associated compliance deadline in the 2020-2022 timeframe. As such, the city will achieve nitrogen compliance far in advance of the Regulation 85 effective date. Regulation 85 phosphorus compliance will be addressed in the second of three projects dedicated to phosphorus removal facilities. The phosphorus project is identified in year 2020 of the CIP and has an estimated cost

of \$18,500,000. The final project outlined in the NCS phasing schedule is the project to address Regulation 31 criteria for nitrogen and phosphorus, which are substantially lower / more stringent than Regulation 85.

Carollo Engineers was hired to perform NUP design services for the city, and the design was completed and approved by CDPHE in November 2014. The project includes three main elements, as well as three additional components that help bolster treatment capabilities and operational flexibility. The six project elements are summarized below. Figure 2 includes a site layout showing NUP project elements.

1. **External Carbon Storage and Feed Facility** – a new 30’x50’ single story building to receive, store, and deliver external carbon to the microbiological process to accomplish improved nitrogen removal through enhanced denitrification. Two carbon sources will be utilized – acetic acid, and brewery waste (a water high in sugars referred to as ‘weak wort’).
2. **Aeration Basin Modifications** – structural, mechanical, electrical, and controls upgrades to the existing aeration basins to convert the process from an MLE process to a 4-stage Bardenpho process, to more optimally utilize internal carbon and any supplemental external carbon.
3. **Solids Contact Tank Modifications** – replacement of existing aeration diffusers inside the existing solids contact tanks to enhance final nitrification (ammonia removal) capabilities.
4. **Post Aerobic Digestion Process** – conversion of an existing pre-dewatering sludge storage tank to an aerated process downstream of the anaerobic digesters, where the microbial process will be controlled to encourage nitrification, and potentially simultaneous denitrification, so that the nitrogen load returned to the liquid stream process after dewatering is significantly reduced. Some benefits on dewatering (i.e. reduced polymer requirements) may result as well.
5. **Centrate Control Improvements** – addition of ammonia probes and associated control programming to allow for load-based centrate return to reduce variability in ammonia loading to the main process and enhance the city’s compliance situation with future low ammonia limits.
6. **Primary Clarifier Bypass** – a short pipeline to allow for bypassing some of the facility flow around the primary clarifier process, with the intention of providing more carbon to the activated sludge process to improve nitrogen removal.

# Nitrogen Upgrades Project Elements



**Figure 2 – Key Elements of Nitrogen Upgrades Project**

In April 2015, the NUP project was publically bid and subsequently awarded to Aslan Construction, for a bid total of \$4,524,000 (including all six project elements). Currently, the project is going through final approvals with Boulder County. It is anticipated that mobilization and construction will commence in August. The project schedule is projected to be 18 months, which should allow for construction completion near the end of 2016. Funding for construction is partially provided by the Nutrient Management Grant, awarded to the city in 2013. \$900,000 remains in the grant help fund the construction effort.

## **IV. OTHER NOTEWORTHY CIP EFFORTS**

While the Nitrogen Upgrades Project is the main CIP effort occurring at the WWTF for the next few years, several other important capital initiatives are underway in a variety of stages.

### **IBM LS Project**

The IBM Lift Station (LS) is 50 years old, and has been modified / upgraded several times, including the most-recent upgrades project which was completed in 2000. Additionally, CDPHE is requiring that the IBM LS meet current wastewater lift station design criteria for overflow protection. The lift station only has limited emergency storage capability in its current

configuration. The largest vulnerability to the lift station is a rapid or sustained increase in flow due to I&I. Sanitary Sewer Overflows (SSOs) have occurred at the lift station, and the most recent event was September 2013. The city plans to address this deficiency and associated SSOs through I&I reduction efforts (cured-in-place-pipe lining and eliminating cross connections) as well as upgrading the lift station.

The city hired Frachetti Engineering Inc. (FEI) to perform design services for the IBM LS project, and the design was completed and approved by CDPHE in early 2015. The project includes replacement of the three sewage pumps, addition of one standby emergency pump, an increased wetwell volume for additional storage capacity to address overflow protection, and station-wide mechanical / electrical / controls upgrades. The city is currently working through the final construction approval process. The project was bid in June and RN Civil Construction is the apparently low bidder at \$1,564,000. Construction is slated to commence in September.

### **PAS Improvements Phase 1**

In 2013, a Process Automation System (PAS) Strategic Plan was developed to identify and prioritize key projects for the WWTF's essential process automation and control systems (SCADA, PLCs, servers, network, and associated componentry). The plan identified 14 projects organized in priorities of Critical (1 to 2 years), High (3 to 6 years), and Medium (7 to 10 years). The 20-year CIP includes annual funding of approximately \$600,000 for nine of the next 10 years. Several of the critical and high priority projects have been lumped into a single project plan that is scheduled for design in 2015. Carollo Engineers has been given the go-ahead to perform the design services, and construction would follow in late 2015 or early 2016. The 2015 CIP includes funding of approximately \$1,200,000 (including 2014 rollover funds) for the current project. City PAS staff are planning to accomplish several of the identified projects in-house without outside consultant support, and only limited contractor support, to achieve some budget efficiencies.

### **Electrical System Upgrades and PAS Phase 2**

While many of the electrical load centers (LCs) and motor control centers (MCCs) are relatively new, some of them are quite old and beyond their useful life. Five (5) LCs and five (5) MCCs are scheduled to be replaced in year 2017. As such, design for the replacement of this critical electrical equipment will take place in 2016. A design budget of \$120,000 and a construction budget of \$1,200,000 are included in the CIP for 2016 and 2017, respectively.