



MEETING MINUTES

Second Creek MDP & FHAD

Alternatives Review (Detention Only)

Date : December 6, 2017
Location : UDFCD
Distributions : Agenda and Detention Handouts (Attached)

Attendees :

<u>NAME</u>	<u>ORGANIZATION</u>	<u>EMAIL</u>
Anna Sparks	Adams County	asparks@adcogov.org
Craig Perl	Aurora	cperl@auroragov.org
Jon Villines	Aurora	jvilline@auroragov.org
Sarah Young	Aurora	syoung@auroragov.org
Scott Olsen	Brighton	solsen@brightonco.gov
Andrew Pihaly	Commerce City	apihaly@c3gov.com
Kevin Lovelace	CORE	lovelace@corecivil.com
Catherine Rafferty	DIA	Catherine.rafferty@flydenver.com
Tom Reed	DIA	tom.reed@flydenver.com
Blake Fulenwider	Fulenwider	blake@fulenwider.com
Tristan Bonser	JR Engineering	tbonser@jrengineering.com
Pat Horn	Martin/Martin	phorn@martinmartin.com
Alan Leak	RESPEC	alan.leak@respec.com
Jennifer Winters	RESPEC	jennifer.winters@respec.com
Haley Heinemann	RESPEC	haley.heinemann@respec.com
Dennis Minchow	Schuck	dam@schuckcommunities.com
Shea Thomas	UDFCD	stthomas@udfcd.org
Teresa Patterson	UDFCD	tpatterson@udfcd.org

1) Purpose

The purpose of the meeting was to review and discuss the project sponsors' comments for the Draft Detention Alternatives Report submitted by RESPEC on November 7, 2017.

2) Introductions

The meeting was opened with introductions.

3) Review of Alternatives

RESPEC recapped the 6 detention alternatives presented in the November 7, 2017 draft report.



4) Comment Review

The group reviewed the comments received from the project sponsors. Editorial comments were not discussed during the meeting and will be incorporated into the final report as requested. The comment log and proposed resolutions are attached to these meeting minutes.

1. **ACTION:** RESPEC will address the comments in the attached comment log.
2. **ACTION:** Kevin Lovelace/ CORE will provide RESPEC with Tower Road survey information.
3. **ACTION:** UDFCD to provide RESPEC will example pro/con tables exhibiting preferred formatting.

5) Selected Alternative

The group identified Alternatives 3a and 3b as the most-desirable alternatives. The stakeholders requested that RESPEC refine Alternatives 3a and 3b by (1) clarifying the cost estimates and anticipated impacts associated with each alternative and (2) refining Alternative 3b to spread out the additional needed storage equitably between Aurora and DIA. A pro/con table will be added to the report to present the advantages and disadvantages associated with each alternative.

1. **ACTION:** RESPEC to further develop cost estimates (including replacement costs for major structures – Tower Road, 96th Ave., and 104th Ave.)
2. **ACTION:** RESPEC to add pro/con table for all alternatives.
3. **ACTION:** RESPEC to refine the volume distribution for Alternative 3b between Aurora and DIA.
4. **ACTION:** RESPEC to evaluate further optimizing S-235 storage in Alternative 3a.
5. **ACTION:** RESPEC to evaluate if Tower, 104th, and 96th have capacity additional to what was required by the 2004 OSP.

**RESPEC****6) Schedule**

- The final Detention Alternatives Report will be submitted by RESPEC on 1/5/2018.
- RESPEC will coordinate with UDFCD to establish a schedule following the submittal of the final detention alternatives.

7) Action Items

- RESPEC will address project sponsor comments in attached comment log.
- CORE will send RESPEC Tower Road survey information.
- RESPEC to refine the volume distribution for Alternative 3b between Aurora and DIA.
- UDFCD to provide RESPEC an example pro/con tables exhibiting preferred formatting.
- RESPEC to develop refined cost estimates (including replacement costs of major structures)
- RESPEC to add pro/con table for all alternatives.
- RESPEC to evaluate optimizing S-235 storage (Alts 3a and 3b).
- RESPEC to evaluate capacities of Tower, 104th, and 96th.

SECOND CREEK MAJOR DRAINAGEWAY PLAN
DRAFT DETENTION ALTERNATIVES COMMENTS (RECIEVED 12/01/2017)

#	LOCATION	ALT	AUTHOR	COMMENT	RESPONSE	
1	Page 2	1. General	Catherine Rafferty/ DIA	Please QA/QC the document for formatting, grammar, spelling, and consistency.	Will revise as requested.	
2	Page 2	1. General	Catherine Rafferty/ DIA	General - Please amend the definition of Denver International Airport to read "(DIA or DEN)." In general, "DIA" can be used to define the physical airport, but "DEN" should be used to define the agency, entity, or organization.	Will revise as requested.	
3	Page 2	1. General	Catherine Rafferty/ DIA	General - Please verify all boundaries described in the report. In locations where the property boundary and jurisdictional boundaries are not concurrent the text should more accurately read something like, "...at the City & County of Denver/Adams County border, within the DIA property boundary..."	Will revise as requested.	
4	Page 11; Section 2.2	1. General	Craig Perl/Aurora	..., Fine Point, Fulenwider, Green Valley Ranch East, 310 West and The Aurora Highlands, (text revision)	Will revise as requested.	
5	Page 13; Figure 2-1	1. General	Catherine Rafferty/ DIA	Fig. 2-1 - Porteos is shown as being in Adams County; however, it was annexed into Aurora. Revise demarcation.	Will revise as requested.	
6	Page 13; Figure 2-1	1. General	Catherine Rafferty/ DIA	Fig. 2-1 - Can this figure also show the upper/middle/lower watershed boundaries described in the text?	Will revise as requested.	
7	Page 13; Figure 2-1	1. General	John Villines/ Aurora	If these colors are meant to indicate jurisdiction, they may need to be updated?	Will revise as requested.	
8	Page 19; Section 3.7	1. General	Craig Perl/Aurora	List IGA and discuss discrepancy on discharge at DIA boundary vs. study.	Will add discussion as requested.	
9	Page 19; Section 3.8	1. General	Craig Perl/Aurora	Discuss difference between "existing" and "natural" conditions.	Will add additional clarification to report text.	
10	Page 20; Table 3-7	1. General	Craig Perl/Aurora	~17% reduction from 2011 to 2017. Explain the changes in input and/or method that led to the reduction in computed flows. (Aurora/DIA Border Q) Is it primarily conversion to CUHP 2.0 and Atlas 14 rainfall?	Future conditions peak flows in the 2014 and 2011 master plans were an average of 14-19% greater than this study. The two changes were: new CUHP and updated land use percent imperviousness. (See last paragraph in Section 3.7). Will add additional clarification to report text as needed.	
11	Page 22	1. General	John Villines/ Aurora	regional? (text revision)	Will revise as requested.	
12	Page 22; Section 5.2	1. General	Catherine Rafferty/ DIA	Pg. 22, Section 5.2 - DEN requests that detention release times are less than 40 hours (absolute maximum of 48 hours) for those detention ponds located within a 10,000 ft. radius, and preferably a 5-mile radius of all existing and future runway edge of pavement limits. See attached exhibit "Separation Criteria Boundaries."	All proposed alternative detention ponds drain within 40 hours. Will revise report text as needed.	X
13	Page 22; Section 5.2	1. General	Craig Perl/Aurora	Per direction from DIA, Aurora has regulated development to a 40 hr release time.	All proposed alternative detention ponds drain within 40 hours. Will revise report text as needed.	
14	Page 23; Table 5.1	1. General	Catherine Rafferty/ DIA	Pg. 23, Table 5.1 - The introductory paragraph for this table is in error. Regional detention occurring on DEN property that provides capacity for non-Airport development (thus providing no benefit to the Airport) would require compensation to DEN for the lease of that capacity or land at fair market value for such use per FAA requirements.	Will revise report text as requested.	
15	Page 23; Table 5.1	1. General	Andrew Pihaly/ Commerce City	The land associated with North Pond is not currently owned by the City of Commerce City.	Will revise Table 5.1 to identify the Reunion Metro District as the owner.	X
16	Page 23; Bullet 4	1. General	Teresa Patterson/ UDFCD	2011 (typo)	Will correct.	
17	Page 23	1. General	Teresa Patterson/ UDFCD	were not included in the conceptual cost estimates for the proposed detention basins. (text revision)	Will revise as requested.	

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#	LOCATION	ALT	AUTHOR	COMMENT	RESPONSE	
18	Page 25; All Figures	1. General	Teresa Patterson/ UDFCD	General comments for all figures: - Add design points to the labels to help correlate these locations back to Table 5-8 - Add some street labels - Add jurisdictional boundaries -I like the use of colored labels to differentiate between detention and target flow locations -Label upper Second Creek	Will revise as requested.	
19	Page 34; Recommended Plan	1. General	Andrew Pihaly/ Commerce City	It is stated that Alternative 3b detention costs are the highest of the 5 alternatives. Alternative 2 costs are the highest.	Will clarify text.	
20	Page 34; Evaluation of Alternatives	1. General	Teresa Patterson/ UDFCD	Even at this stage, we need a pros/cons table/discussion to see the alternatives side-by-side. See comment in Appendix F to bring some of the information forward in summary table.	Will add a pro's/con's table to the report text along with additional commentary and summary for each alternative, highlighting the benefits and disadvantages between the alternatives.	X
21	Page 34; Benefit Cost Analysis	1. General	John Villines/ Aurora	Please detail the cost of detention by jurisdiction.	Will be added as requested.	
22	Page 35; Table 5-8. Q Comparison	1. General	Teresa Patterson/ UDFCD	List detention basins here, too.	List will be added.	
23	Page 36	1. General	John Villines/ Aurora	Will the criteria for GG1 and GG2 to be considered permanent regional facilities be included in the alternatives analysis as discussed during the workshop?	Yes. All detention basins owned by the developers in the City of Aurora are meant to be permanent, regional facilities. Will add clarification text discussing the discretization into smaller ponds.	X
24	Page 91; Table F-1. Parcel K Pond	1. General	Teresa Patterson/ UDFCD	Really should take stab at costing out the overflow and channel work since it is an integral part of the basin function. It can be refined more in future.	A preliminary estimate will be added and revised as needed in the future.	X
25	Page 91	1. General	Teresa Patterson/ UDFCD	per ? (text revision)	Will correct.	
26	Page 91; Detention Tables	1. General	Teresa Patterson/ UDFCD	General comments for all 4 detention detail tables: - Break out the cost and volume by jurisdiction (which govt it resides in). If contributions by others are required, we'll hash that out later. - I think that some of this information should be included in summary in Section 5: Qin, Qout, V, \$ (by jurisdiction). It would be nice to include a comparison table in the text body between the alternatives, too. It is really hard to visualize and grasp the physical differences between these alternatives. Table 5-8 is somewhat helpful, but doesn't tell the full picture very well.	Will be revised as requested.	
27	Page 91; Detention Tables	1. General	Craig Perl/Aurora	Provide cost breakout by entity (Aurora, DIA, Commerce City). For all alternatives.	Will be added as requested.	
28	General	1. General	Andrew Pihaly/ Commerce City	Please verify that the basin volume transfer from Third Creek to Second Creek (referred to as T-88) has been accounted for in the calculations.	Yes; This study considers the flow diversion from Third Creek to Second Creek via the T-88 drainage improvements as existing conditions. The diverted flow was included in the baseline hydrology and, therefore, considered in the detention alternatives analysis. See page 3-2 "Subcatchment Delineation" in the text for a discussion regarding the incorporation of T-88 into the baseline hydrology.	
29	General	1. General	Craig Perl/Aurora	In order to facilitate discussion of alternatives, please have information at the ready regarding limitations of DIA's infrastructure, such as the capacity of culvert crossings at Pena Blvd and Jackson Gap.	Evaluation of crossings will occur during the completion of the alternatives phase, following the selection of a detention alternative.	
30	General	1. General	Craig Perl/Aurora	Concerns expressed by Aurora developers regarding the location and distribution of regional detention appear to have been addressed. Thank you.	Noted.	

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DRAFT DETENTION ALTERNATIVES COMMENTS (RECIEVED 12/01/2017)

#	LOCATION	ALT	AUTHOR	COMMENT	RESPONSE	
31	Page 26; Alt 3a	Alt. 3a	Teresa Patterson/ UDFCD	How were Parcel K and North Pond modeled? Were there any modifications made to North Pond to "improve" on the current design to better reach Natural Conditions?	Will add clarification to report text. Stage-storage and stage-discharge curves for the North Pond were estimated from the preliminary design "Reunion/112th Avenue Regional Water Quality & Detention Facility" construction plans by JR Engineering, dated January 2002. For Alternatives 3a and 5, an additional (fifth) 10'x5' CBC was added to the hydrologic model to prevent overtopping of the road. Stage-storage for the Parcel K pond was estimated from the "T-88 Bid Alternative System Drainage Report" by Huitt-Zollars, dated May 2016. The pond would require a berm adjacent to Second Creek and additional channel work in order to function as proposed.	X
32	Page 26; Alt 3a	Alt. 3a	Teresa Patterson/ UDFCD	Full assessment of this option will need to incorporate improvements at these 3 roadways.	Will revise as requested.	X
33	Page 26; Section 5.6.1.3	Alt. 3a	Teresa Patterson/ UDFCD	downstream of (text revision)	Will revise as requested.	
34	Page 26; Section 5.6.1.3	Alt. 3a	Teresa Patterson/ UDFCD	separate flows to (text revision)	Will revise as requested.	
35	Page 26; Section 5.6.1.3	Alt. 3a	Teresa Patterson/ UDFCD	5 vs. F (figure name revision); global	Will correct.	
36	Page 26; Section 5.6.1.3	Alt. 3a	Teresa Patterson/ UDFCD	to limit (text revision)	Will revise as requested.	
37	Page 26; Section 5.6.1.3	Alt. 3a	Teresa Patterson/ UDFCD	Please list the Aurora Development Detention Basins along with the development associated with them.	Will revise as requested.	
38	Page 26; Section 5.6.1.3	Alt. 3a	Craig Perl/Aurora	...other quasi-governmental entities... (instead of "equivalent jurisdictions") (text revision)	Will revise as requested.	
39	Page 27; Figure 5-2. Alt 3a	Alt. 3a	John Villines/ Aurora	Do these match the locations and volumes of the proposed and existing Porteos ponds?	Yes. Will add clarification to report text.	
40	Page 27; Figure 5-2. Alt 3a	Alt. 3a	Andrew Pihaly/ Commerce City	The volume of the North Detention Pond in Alternative 3b (358 AF) is shown as 85 AF more than in Alternative 3a (273 AF), yet the flows through the City of Commerce City in Alternative 3b are less. Please explain how the detention volumes were determined.	Typo. The pond volume will be revised to 400 AF for Alternative 3a.	
41	Page 92; Alt 3a/ Pond S-235	Alt. 3a	Teresa Patterson/ UDFCD	Provides very little flow reduction. Can this be optimized to provide a more meaningful reduction?	The intent of Alternative 3a was to minimize the size of Pond S-235 by requiring the City of Aurora to detain to natural conditions flows.	X
42	Page 28; Alt 3b	Alt. 3b	Catherine Rafferty/ DIA	Pg. 28, Section 5.6.1.4 - DEN objects to the assumption that the additional storage will occur only at Pond S-235 within DIA. DEN recommends adding Alternative 3c, which distributes the additional capacity required to the upstream development.	Agreed. The report text states that the storage should be split between the City of Aurora and DIA. Will add additional clarification text to the report.	X
43	Page 28; Alt 3b	Alt. 3b	Andrew Pihaly/ Commerce City	As stated in the summary, E 104th Ave is shown to overtop in the 100-yr storm with this alternative. It is stated that the bridge will be evaluated during the hydraulics analysis to ensure that it has the needed extra capacity. If this alternative is chosen, we would like to ensure that E 104th Ave has the required capacity.	The 2004 Kiowa 100-year proposed peak flow (4,310 cfs) was approximately 250 cfs less than the proposed Alt 3b peak flow (4,567). For the purposes of this analysis, 250 cfs was deemed within acceptable limits. The E 104th Ave bridge will be evaluated to verify that it has the necessary capacity for the additional 250 cfs proposed by this alternative.	X
44	Page 28; Alt 3b	Alt. 3b	Teresa Patterson/ UDFCD	detain (text revision)	Will revise as requested.	

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DRAFT DETENTION ALTERNATIVES COMMENTS (RECIEVED 12/01/2017)

#	LOCATION	ALT	AUTHOR	COMMENT	RESPONSE	
45	Page 28; Table 5-4. Alt 3b Flow Red	Alt. 3b	John Villines/ Aurora	Isn't this above capacity for 104th and Tower Rd?	The 2004 Kiowa 100-year proposed peak flow (4,310 cfs) was approximately 250 cfs less than the proposed Alt 3b peak flow (4,567). For the purposes of this analysis, 250 cfs was deemed within acceptable limits. The E 104th Ave bridge will be evaluated to verify that it has the necessary capacity for the additional 250 cfs proposed by this alternative. Tower Rd. is off by 44 cfs which is assumed to be within the margin of error of the hydrologic analysis.	X
46	Page 29; Figure 5-3. Alt 3b	Alt. 3b	John Villines/ Aurora	Should this figure show a representative pond to indicate that additional detention is required? Or at least highlight the different Proposed Q100's from 3a?	Will revise as necessary.	
47	Page 35; Recommended Plan	Alt. 3b	Catherine Rafferty/ DIA	Pg. 34, Section 5.9 - Alternative 3b is only acceptable for further consideration by DEN if the additional capacity required at Pond S-235 is resulting only from Airport development. Additional capacity at Pond S-235 to support upstream development in Aurora is unacceptable to DEN and should be distributed back onto those upstream developments.	Agreed. The report text states that the storage should be split between the City of Aurora and DIA. Will add additional clarification text to the report and make associated updates to the hydrologic model.	
48	Page 23; Alt 4	Alt. 4	Catherine Rafferty/ DIA	Pg. 23, Alternative 4 - Please note that DEN does not fully agree with the statement that "because the footprint of the floodplain is not developable land." It is agreed that modifying the floodplain would be more complex, but not definitive. In addition, it remains unclear what requirements might impact this area when the future runway complex is built in terms of drainage and wildlife hazard mitigation.	Will revise report text as requested.	
49	Page 30; Alt 4	Alt. 4	John Villines/ Aurora	Figure 5-4 shows it downstream of the border. (S-219)	Typo. Will correct to "downstream."	
50	Page 94; Alt 4/ Pond S-219	Alt. 4	Teresa Patterson/ UDFCD	Does not provide meaningful reduction in flow	We looked into this Alternative based on comments received during the detention workshop. We agree that the pond does not provide a significant reduction in flow and is not an overall desirable alternative. Will add clarification text to the report.	X
51	Page 23; Alt 5	Alt. 5	Craig Perl/Aurora	Need to discuss ("costs including land value would be assumed to be covered by the developers upstream in the City of Aurora")	Agreements between individual jurisdictions and developers will not be covered by the master plan.	X
52	Page 32; Alt 5	Alt. 5	John Villines/ Aurora	Is the only difference between this alternative and 3b that this one just detains to historic conditions with additional detention in 235 while 3b detains to the design flow for the downstream crossings? Or 3b includes add	Alternative 5 allows for detention from the City of Aurora on DIA property (assuming an agreement between DIA and Aurora). Alternative 3b assumes that the additional needed storage for Tower Road would be split between Aurora and DIA.	
53	Page 32; Alt 5	Alt. 5	Teresa Patterson/ UDFCD	Full assessment of this option will need to incorporate improvements at these 3 roadways.	Will revise as requested.	
54	Page 32; Alt 5	Alt. 5	Catherine Rafferty/ DIA	Pg. 32, Section 5.6.1.6 - This alternative is found to be objectionable by DEN Planning for reasons stated earlier. DEN does not believe that it needs to detain upstream development flow from Aurora on Airport property within the RW 7/25 approach/departure path area.	Noted. Will discuss preferred alternatives during review meeting.	
55	Page 32; Alt 5	Alt. 5	John Villines/ Aurora	Is this different than scenario 3b?	Alternative 5 allows for detention from the City of Aurora on DIA property (assuming an agreement between DIA and Aurora). Alternative 3b assumes that the additional needed storage for Tower Road would be split between Aurora and DIA.	

SECOND CREEK MAJOR DRAINAGEWAY PLAN
DRAFT DETENTION ALTERNATIVES COMMENTS (RECIEVED 12/01/2017)

#	LOCATION	ALT	AUTHOR	COMMENT	RESPONSE	
56	Page 32; Alt 5	Alt. 5	John Villines/ Aurora	How are we going to evaluate this alternative without an estimate of the costs? It will likely be in part a benefit-cost analysis on the part of the developers with respect to their available developable land.	Additional costs related to a potential agreement between DIA and Aurora would need to be determined should Alternative 5 become the final selected alternative.	X
57	Page 32; Alt 5	Alt. 5	John Villines/ Aurora	Shouldn't it be reduced storage? The additional storage is in S-235 correct?	Additional storage relative to the rest of the basin, not other alternatives. Will revise text to clarify.	
Preferred Alternatives						
58	Page 23; Alt 5	Alt. 5	Catherine Rafferty/ DIA	Pg. 23, Alternative 5 - DEN Planning objects to this alternative. DEN will not allow additional storage from the upstream areas of the City of Aurora in this location. Pond S-235 is situated within the runway approach/departure path of existing RW 7/25 and finds that additional storage beyond the Airport's requirements would not be acceptable.	Noted. Discussed preferred alterantives during the review meeting.	X
59	Page 22	Alt. 2	Andrew Pihaly/ Commerce City	The preferred alternative for the City of Commerce City is Alternative 2. E 96th Ave, E 104th Ave, and Tower Road all pass the 100-yr storm event. In addition, the Parcel K Pond and North Pond volumes are the minimum required between alternatives. The other options place an undue burden in terms of land acquisition and costs on Commerce City to handle upstream flows.	Noted. Discussed preferred alterantives during the review meeting.	X
60	Page 24; Alt 2	Alt. 2	Catherine Rafferty/ DIA	Pg. 24, Section 5.6.1.2 - DEN understands the need for a comparison to the previous study recommendations; however, just to be clear, DEN would find it completely unacceptable for Pond S-219 to be developed as proposed in this alternative. The pond footprint would encroach upon Airport property that is now developable. It would also most likely be found objectionable by the FAA due to its size and proximity to future RW 7R/25L.	Noted. Discussed preferred alterantives during the review meeting.	X

*Comments notated with a white "X" in a red box were discussed during the 12/6/2017 meeting.

