

# Chehalis Basin Local Actions Program • Technical Advisory Group

## MEETING 3 SUMMARY

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**Date:** Friday, November 13, 2020

**Time:** 8:00 am – 12:00 pm PST

**Location:** Zoom online meeting

### Purpose of Meeting

The purpose of the Local Actions Program (LAP) Technical Advisory Group (TAG) Meeting 3 was to gather TAG members' initial reactions, thoughts, and questions on the potential for increasing floodplain storage and potential local flood protection actions (both structural and nonstructural). The meeting had four guiding questions:

1. Are there other locations or alternatives for adding floodplain storage that should be considered?
2. Are there other technical considerations for any of the potential floodplain storage locations?
3. Are you aware of other areas, besides the example priority areas, that have relatively high potential for flood damages and relatively dense development that should be added to the list for near-term consideration?
4. Are there other possible structural or nonstructural solutions and technical considerations?

### Meeting Notes

These meeting notes are intended to be a public record of key points, questions, and discussion topics raised during the meeting. They are not intended to be transcripts. The meeting was recorded on Zoom.

### TAG Meeting 2 Debrief

Jim Kramer (meeting facilitator) summarized feedback on the TAG Meeting 2 process and technical information provided. Key takeaways and follow up questions regarding the delineation of the future floodplain included:

- Existing hydraulic models can provide information for a comparative assessment, but they may underestimate or overestimate the floodplain and/or incorrectly map some areas, similar to how FEMA maps often under or overestimate the floodplain. Therefore, modeled floodplains need to be ground-truthed with local experts that are knowledgeable of local conditions. Damage information from past flood events can help prioritize areas for flood damage reduction.
- Flow rates can be affected by many factors, including climate change, development trends, long-term forestry practices, and conservation.
- *Question:* Does the model consider areas where constrictions to flow cause flooding? Could there be opportunities with LAP to address constrictions that aren't prioritized under ASRP?  
*Response:* The model includes major infrastructure (e.g., bridges or large culverts) but it doesn't have the level of detail to include smaller constrictions. The Chehalis Basin Flood Authority has

done some work on this level and there was an Earth Econ study for part of a sub-basin that may have relevant results.

FOLLOW UP: Look into work that's already been done to connect habitat issues (e.g., fish passage barriers) and flood problems: Chehalis Basin Flood Authority and Earth Econ ([link](#)).

## Potential for Increasing Floodplain Storage

Larry Karpack (Watershed Science and Engineering) summarized information regarding actions to increase floodplain storage and reduce flood damage in the Chehalis River Basin as described in the *Summary and Evaluation of Options for Increasing Floodplain Storage Memorandum* (October 30, 2020). The presentation included showing mapping of the projected increase in flood depths between the current and 2080 100-year floodplain; a brief description of the benefits and limitations of floodplain storage in general; a summary of four previous studies that focused on floodplain storage in the basin; and the results of a new high-level evaluation of areas that could provide opportunities for increased floodplain storage. The TAG will discuss near- and long-term options related to floodplain storage at the next meeting.

Key comments, questions, and discussion topics:

- *Question:* Is it possible to successfully combine structural and floodplain storage approaches to minimize impacts? For example, in Skagit County, the diking and drainage districts have invested in large pumps, regular ditch maintenance, and floodplain storage to minimize (not control) flooding. *Response:* Yes, this is possible if the area exists. There are currently no available large areas in the basin for floodplain storage, except for the areas that already provide floodplain storage. There are a few areas in the floodplain that are kept dry because of things like levees, trails, or railroad embankments that prevent water from reaching the floodplain.
- The largest area that may have viable floodplain storage is on the Black River upstream of SR 12. It is approximately 1,150 acre feet.
- For context the proposed dam would provide 65,000 acre feet of storage and reduce water levels in Centralia by up to 2.7 feet.
- *Question:* When looking at elevation increases in localized areas and analyzing potential flood storage projects, is there consideration as to the existing conditions of the areas that would experience increased elevations? i.e., an increase in elevation in areas of flooding that are currently wetlands/non-developed wet areas - is that considered a "negative impact"? *Response:* That would require a more detailed evaluation. WSE quantified estimates of available storage in the provided technical memorandum and made a qualitative assessment of potential impacts. However, these have not been modeled yet. Additional detailed modeling would provide an understanding of off-site impacts/benefits, and what mitigation would be required.
- *Question:* Has there been any consideration given to physically lowering large areas of floodplain to provide greater storage volumes? *Response:* At this point, we are not aware of any large areas in the floodplain that would be viable for this type of project. Nor are we aware of any proposed projects of this type, with the exception of the Chehalis WWTP and Master Storage Plan.
- The next step for City of Centralia City of Chehalis Wastewater Treatment Plant Restoration and Flood Storage Master Plan is to evaluate design changes to reduce downstream water level increases and to determine the cost to remove/excavate approximately 1.5 million cubic yards

(930 acre-feet) of floodplain material to increase available on-site flood storage. This information would help inform if similar solutions are feasible in other locations.

- *Question:* What's the current land use/property ownership in the area of the Black River location? *Response:* This will need to be researched as part of the evaluation for Black River storage. An initial review of Thurston County tax records indicates that there are numerous landowners in this area, some public and some private.
- *Question:* It would be helpful to have a statement for how and why floodplain storage would benefit the basin compared to other potential projects that could influence conveyance and potentially reduced flood inundation (e.g. removal of roadway embankments, larger water crossing opening, etc.). *Response:* This will be provided.

The TAG divided into four breakout groups to discuss two questions related to floodplain storage:

1. Are there other locations or alternatives for adding floodplain storage that should be considered?
2. Are there other technical considerations for any of the potential floodplain storage locations listed in Table 2 that would change their viability between the YES, MAYBE, NO classifications?

Key input from breakout groups shared with the entire TAG included:

- There is a need to clarify the criteria the Chehalis Basin Board (Board) could use to determine the potential for a project to advance the Board objective to reduce flood damage from major flood events.
- A basin-wide model is needed to assess floodplain storage and understand how action in a tributary might affect the whole basin, or its “ripple effect.” Many tributaries haven’t been modeled yet.
- It would be helpful to spend more time with the maps and have a better understanding of where critical structures are located. The Board’s goals in terms of structural outcomes could limit potential approaches to floodplain storage. In terms of reducing flood damage, it might make more sense to relocate structures to create more flood storage.
- Are there other locations or alternatives for adding floodplain storage that should be considered?
  - Black River has potential and it appeared to be mostly agricultural land.
  - Skookumchuck reservoir: there is an opportunity to create flood storage.
  - Incorporate culvert crossings into the model; those would show more concentrated flows or you may show areas that have more flooding today. Make sure natural drainage, county and local infrastructure are captured in the model. This is tough to do in planning level, more of a design level detail, but this could be an important consideration in the future.
  - Build on City of Centralia Wastewater Treatment Plan floodplain storage project - could excavate another 2-3M cy of material? If it results in a small amount of storage, that may not provide the amount of storage required. However, how many projects are required (and at what cost) to equal a similar storage to the dam (65,000 acre-feet)?
  - Flood water could be used as aquifer and groundwater recharge. Centralia relies on groundwater.
  - Look at WDFW owned lands.
  - Floodplain reconnections provide storage and flow reduction during much smaller floods and local water level reductions

- Check the Streamflow Restoration Plan for managed aquifer recharge projects that might provide storage benefits
- New variations of tide gates could provide better use of storage without environmental impact, but these projects are challenging both politically and technically
- Beaver dam analog (BDA) projects could provide small distributed areas for storage that could provide local benefits
- Lake Creek, Lincoln Creek, Hanaford Creek should all be looked at
- Are there other technical considerations for any of the potential floodplain storage locations listed in Table 2 that would change their viability between the YES, MAYBE, NO classifications?
  - Model refinements could change moving one action from a no to maybe or maybe to yes. For example, #28 is tied to model accuracies. If culverts are not in there, backwater may not be accurately represented.
  - The highways tend to create blockages. Roads could be elevated or create bridges, but you would need to do that in strategic locations. For example: add crossing structures and raising roadways to reduce back-up. There would be backwater, so would need to determine upstream and downstream effects.
  - There is a cascading effect - anything you do in one location will have upstream and downstream effects. For example, if you raise one roadway, would need to look at other roadway changes that are upstream and downstream of the roadway raise. This includes the ones that have been identified as potentially viable.
  - Don't discount cumulative benefits of smaller projects
  - Consider localized benefits
  - Look for large tracts of land in single ownership
  - Are there new technologies (like self-regulating tidegates) that would be useful?
  - Remove the natural constriction at Mellen Street or create a bypass? Could this reduce flooding? What would be increase in flows downstream?
  - Need upstream and downstream impact analysis for any projects
  - Identify areas with repetitive losses where it may reduce flood damages most to relocate structures; some areas initially in maybe or no categories might have structures, but landowners may be interested in relocation

FOLLOW UP: TAG will take more detailed look at the memo and send thoughts/comments to focus Dec. TAG meeting and discussion of the floodplain storage options.

## **Potential Local Flood Protection Actions (Structural and Nonstructural)**

Merri Martz (Anchor QEA) summarized information on potential local flood protection actions as described in the *Local Flood Protection Action Options Technical Memorandum* (November 9, 2020). The presentation included a review of existing flood protection facilities in the Chehalis Basin; a summary of previous studies related to proposed flood protection facilities; and identified example priority areas where improved or new local flood protection facilities could be considered. Some actions have been identified as strategies within the Community Flood Assistance and Resilience (CFAR) program that could be implemented as part of the LAP.

The TAG divided into the same four breakout groups as earlier in the meeting to discuss two questions related to potential local flood protection actions:

1. Are you aware of other areas, besides the example priority areas, that have relatively high potential for flood damages and relatively dense development that should be added to the list for near-term consideration?
2. Are there other possible structural or nonstructural solutions and technical considerations?

Key takeaways from breakout groups shared with the entire TAG included:

- In addition to at-risk structures, damages and impacts to other types of infrastructure and land should not be ignored.
- There are several flood-prone areas that are not currently densely populated but are ripe for development (e.g., Bishop Road or Monte Elma Road).
- Recent FEMA policy changes recognize ecosystem services as a benefit which changes benefit-cost analyses.
- In densely populated areas, structural changes tend to be more popular and relocation/buyout programs are more challenging.
- Eventually the TAG will need to provide input on what projects merit more focus for the Board consideration. Every project will have advantages and disadvantages; establishing metrics or criteria to assess any given project could help prioritize them. Possible metrics include number of structures positively or negatively affected; cost; data availability; amount of managed water; overall feasibility; restorative or habitat aspects associated with the action;
- Are you aware of other areas, besides the example priority areas, that have relatively high potential for flood damages and relatively dense development that should be added to the list for near-term consideration?
  - Grand Mound in Thurston County
  - Scatter Creek Basin, which comes into Grand Mound (aquifer that goes to Tenino). Also has potential for high development
  - Town of Galvin
  - City of Centralia - old WWTP, in the sewer plan the force mains could be moved to avoid this affect
  - Town of Bucoda
  - Satsop Riviera development on Satsop River has flood, erosion, and channel avulsion risks
  - Area along Monte-Elma Road is at flood risk in the future
  - Bishop Road near Lewis Conservation District
  - Highway 12 between Montesano and Central Park
  - Onalaska
- Are there other possible structural or non-structural solutions and technical considerations?
  - Extend the Long Road levee to the east, to protect south part of Centralia, near the area of the transfer station
  - Elevate I-5, however there will be upstream benefit and downstream impact
  - Update model for levee or roadway structural solutions
  - Consider FEMA updates when considering new levees
  - Grand Mound wastewater treatment plant - there are groundwater effects, but it's likely closely connected
  - For all of the communities, need to consider water wastewater treatment effects based on any of the potential new structural solutions
  - Look at smaller projects on smaller tribes
  - Coordinate with ASRP

- Road raising is a concern as it may increase upstream flooding
- Pump stations?
- Need to consider floodplain with 50% increase in flows
- Need to consider development at 2080 build out and not just current development
- Need to expand hydraulic model extent to cover more tributaries

FOLLOW UP: OCB Team will plan to put together more detail about what was discussed.

## Next Steps and Summary of Follow-Up Actions

The next Technical Advisory Group meeting is scheduled for Monday, December 14, 2020, from 1:00 PM to 5:00 PM, PST.

Below is a summary of follow-up actions identified during the meeting:

- Look into work that's already been done to connect habitat issues (e.g., fish passage barriers) and flood problems: Chehalis Basin Flood Authority and Earth Econ ([link](#)).
- Determine land use/property ownership in the area of the Black River potential floodplain storage location.
- TAG will take more detailed look at the memo and send thoughts/comments to focus Dec. TAG meeting and discussion of the floodplain storage options.
- OCB Team will plan to put together more detail about what was discussed; will email about what a matrix might look like.