

Project Name | H/H Model Update**Date** | 4/1/2025**To / Contact info** | BCWD Board of Managers**Cc / Contact info** | Karen Kill, District Administrator**From / Contact info** | Camilla Correll, PE**Regarding** | Flood Vulnerability Assessment

Background

The BCWD is in the process of completing substantial updates to its hydrologic and hydraulic (H/H) model (H/H). These updates include the use of newer datasets (i.e., updated LiDAR and land use information), updated rainfall data (i.e., NOAA Atlas 14, NEXRAD Radar), and the incorporation of recently permitted development activities. Improvements to the H/H model can help the District and its member communities understand how water moves through the watershed and facilitate data-driven decisions to improve flood control, water quality, infrastructure design, and ecosystem health.

One of the goals for completing this H/H Update was to incorporate the results in the 2026-2037 Watershed Management Plan Update. For example, the updated H/H model can be used to provide the following:

- More accurate high water levels (HWL's) for the District's lakes, ponds, and wetlands.
- More accurate velocities in Brown's Creek and its tributaries.
- Identify areas where capacity or scour are a concern, e.g., at culverts, bridges, and in stream reaches.
- Areas and infrastructure subject to flood risk.

Now that the H/H model update is complete, it will be important to share the results (i.e., the predicted changes) for existing and projected (future) conditions with stakeholders and the District's member communities. This type of engagement is helpful in vetting or ground-truthing the modeling results and in identifying potential areas of concern. If this information can be collected as part of the WMP Update process, the issues, needs, and potential solutions can be included in the 10-year implementation plan.

Scope of Work

The scope of work for the H/H Update did not include using the model outputs to conduct a flood vulnerability assessment. Conducting a flood vulnerability assessment entails using the updated H/H model to engage communities in identifying hazards, evaluating impacts, and prioritizing the studies and/or flood reduction projects that need to be included in the watershed management plan. Given that the District has had limited participation by member communities in the watershed management planning process, this would be an opportunity to engage them in meaningful conversation about the types of impacts we expect to see more of in the next 10-20 years. It should be noted that this flood reduction assessment will use the updated H/H model, which includes existing land use conditions. This assessment will include an estimate of future rainfall conditions, but not include an evaluation of future land use because....

The vulnerability assessment would include the following steps:

1. Critical Event Analysis - Run the model for the 2-, 10-, 25-, 50-, and 100-year, 24-hour rainfall events as well as the frozen ground 7.2" runoff event, which was analyzed for landlocked lakes for the District Ponds Flood Risk Assessment.
2. Use the model outputs to create a series of figures to review potential impacts with stakeholders and member communities for the Mean Event (7.2" 100-year, i.e., current conditions), and the 90th Percentile Event (9.5" 100-year i.e., future/projected conditions):
 - a. 100-year HWL

- b. Flooded Structures
 - c. At-Risk Structures within 15' of flood footprint
 - d. Road Overtopping (Frequency, depth, and duration)
 - e. Street & structure flooding under 10-year, 24-hour event
 - f. Velocity change in Brown's Creek/Tributaries
3. Intersect the projected flood footprints with existing GIS map layers to identify social, environmental, and infrastructure impacts as follows:
- a. Social
 - i. Flooding of residential structures, private wells, septic systems.
 - ii. Flooding of trails/parks.
 - b. Environmental
 - i. Flooding in areas of high pollution sensitivity of near-surface materials, wellhead protection areas, and emergency response areas.
 - ii. Flooding of contamination sites.
 - iii. Flooding of impaired waters.
 - iv. Flooding of Groundwater Dependent Natural Resources and native plant communities connected with groundwater.
 - v. Flooding of areas with high soil erosion risk.
 - vi. Flooding of Biological Survey Sites of Biodiversity Significance.
 - c. Infrastructural
 - i. Flooding of roads, culverts, critical infrastructure such as hospitals, police stations, emergency services, electrical substations, schools, churches, and emergency routes.
4. Community Engagement and Hazard Identification Meetings – Utilizing the flood elevation mapping, conduct meetings with local elected officials and staff to review flood mapping and identify and prioritize hazards.
5. Final Report - Summarizes the steps and deliverables developed for the Flood Vulnerability Assessment. This document will be used to continue engagement with communities and Washington County to identify and prioritize hazards, guide future infrastructure sizing, critical infrastructure replacement, and potential rule revisions by the Brown's Creek Watershed District as well as the Comprehensive Planning process and ordinance revisions for communities.

The following table outlines the timeline, cost, and hours anticipated for this effort.

Task	Timeline	Estimated Hours	Estimated Cost
Critical Event Analysis	April - May	74	\$11,771
Create Figures/Maps	April - May	63	\$10,541
Intersect with Social, Environmental, and Infrastructural GIS Layers	April - May	16	\$2,856
Community Engagement Meeting	June	32	\$6,104
Report and Recommendations	June	16	\$2,908
TOTAL	NA	201	\$34,180

Board Action

1. Approve this scope of work for EOR's involvement in the Flood Vulnerability Assessment in the amount of \$34,180 from account number 923-0000.