

## Appendix H: Supplemental Flooding Analyses

### US 51 Hickman County, Approx MP 14-15 (Obion Creek)

Existing HEC-RAS Model (**Figure 1**) shows 5-year storm does not overtop bridges but it does overtop in the sag point towards the north. A 50-year storm reaches elevation 330.4, about 2 feet above the low-lying sag.

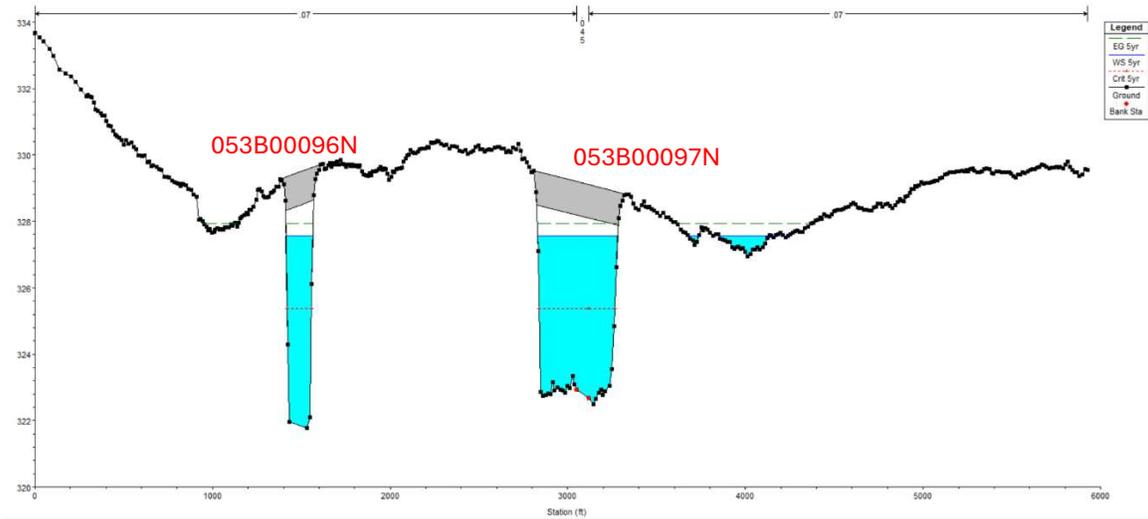


Figure 1: Existing Model, 5-year storm

Raising roadway elevation 2 feet (not touching bridges), 10-year storm reaches bottom of the bridges (**Figure 2**) and 25-year storm overtops (**Figure 3**). Both bridges currently in Fair condition. This solution is shown in attached PDF; a higher profile would convey more water but substantially increase costs to replace bridges.

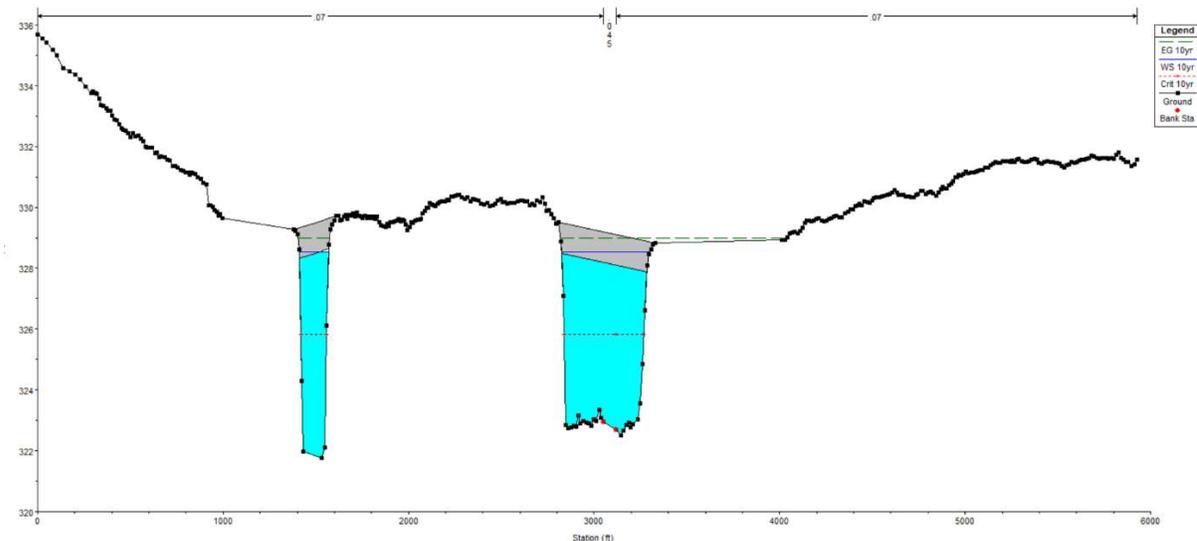


Figure 2: Proposed Model, 10-year storm

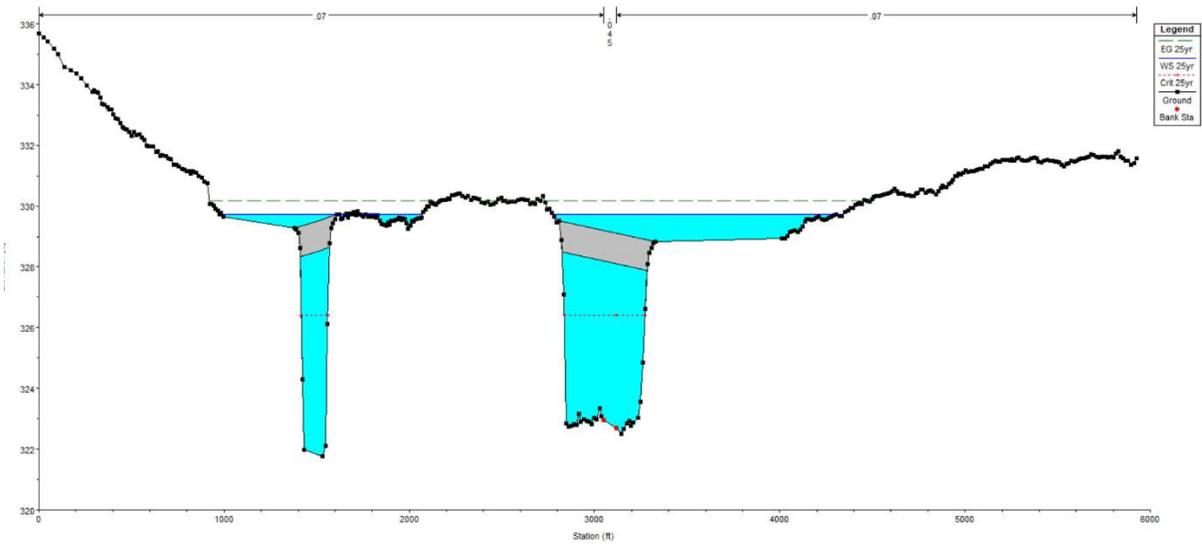


Figure 3: Proposed Model, 25-year storm

### US 51 Hickman County, Approx MP 9-10 (Cane Creek)

Existing HEC-RAS model shows a 25-year storm approaching bottom of Bridge 053B00101N and starting to overtop sag in roadway to north.

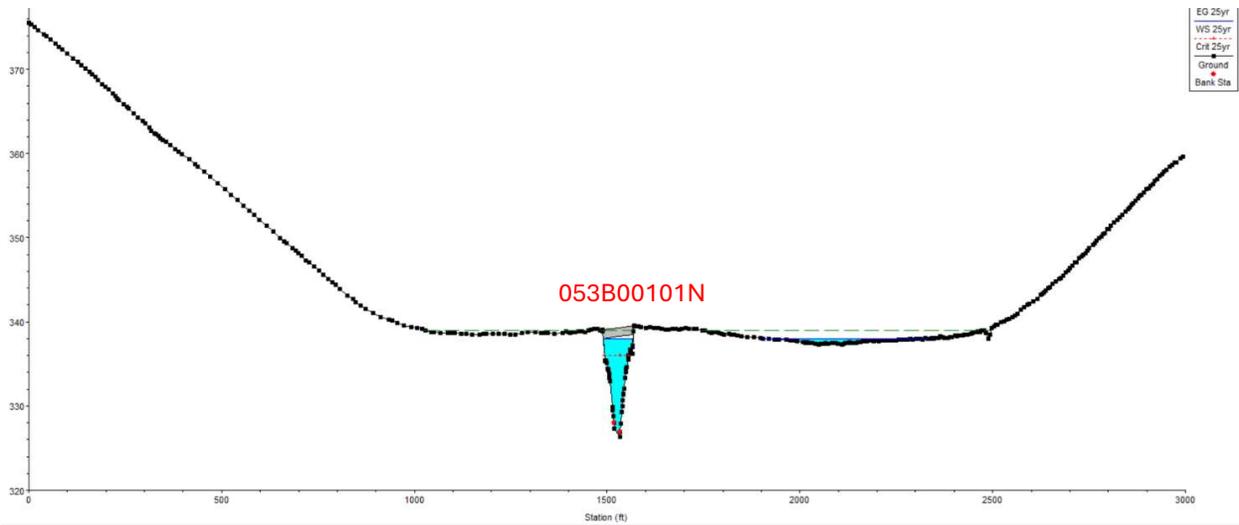


Figure 4: Existing Model, 25-year storm

Raising roadway elevation 2-2.5 feet (not touching bridge), 50-year storm reaches the bottom of the bridge (Figure 5). See attached PDF for plan/profile sketch.

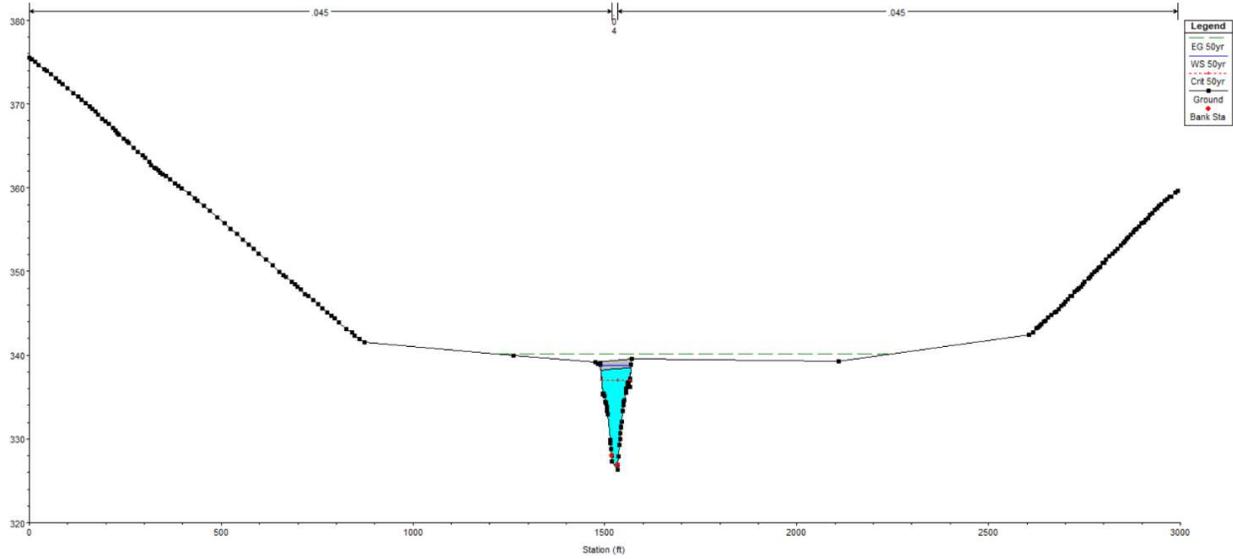


Figure 5: Proposed Model, 50-year storm

Shown in **Figure 6**, a 100-year storm overtops the bridge and raised road. Raising the roadway another foot and replacing the bridge with a slightly higher/longer bridge should accommodate 100-year storm but with greater costs. (053B00101N is rated in Good condition currently.)

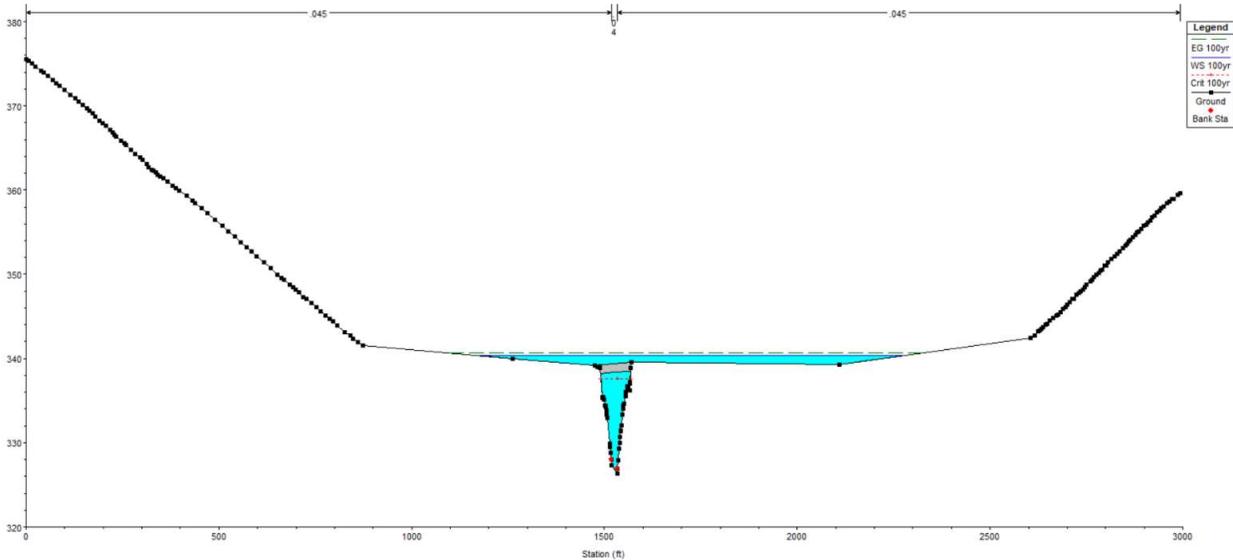


Figure 6: Proposed Model, 100-year storm

## US 51 Hickman County, Approx MP 4-5 (Bayou de Chien)

This one's a bit different. We ran the Existing model (**Figure 7**) that shows a 2-year storm overtopping the sag north of the bridge.

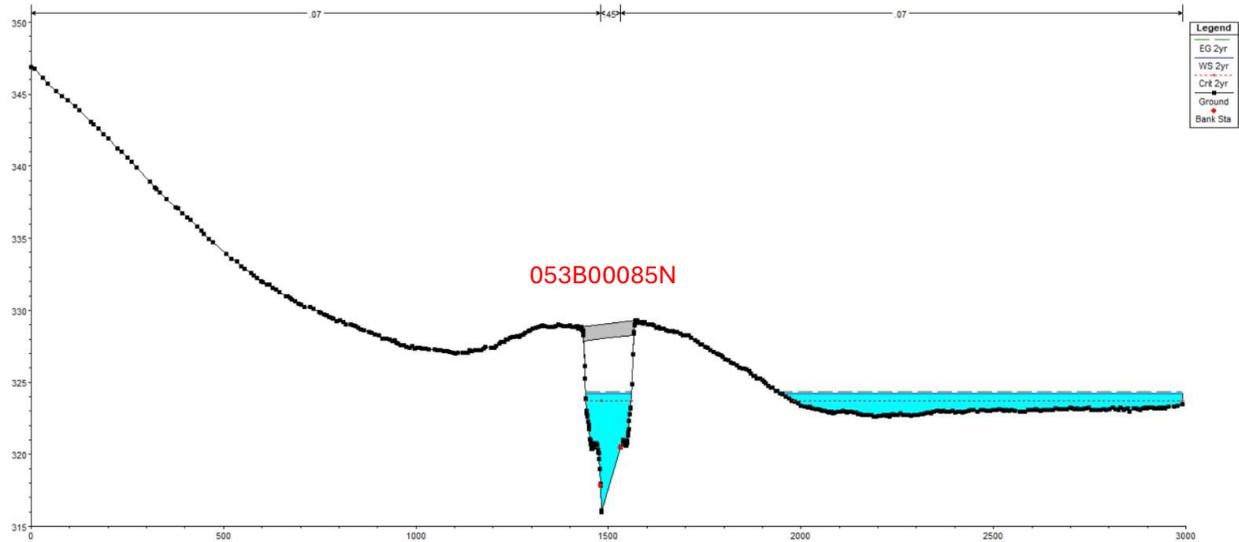


Figure 7: Existing Model, 2-year storm

It's relatively flat through this stretch. Seems like the issue is driven by the 1,500-foot-long embankment northwest of the bridge (**Figure 9-Figure 8**). It's effectively protecting the field behind it and converting the ditch in that stretch into a standing pond.



Figure 8: Streetview along Ditch



*Figure 9: Aerial north of 053B00085N*

The proposed model requires a large hydraulic passage but spread over a relatively long stretch. Practically, you're looking at jacking the profile way up (8-12 feet) to get enough clearance for a new structure or scattering in a ridiculous number of smaller culverts/pipes. Neither seems especially reasonable.

Looking at the 2025 inspection photos for 053B00086N (**Figure 10**), seems like there's a lot of gunk built up at the outlet, restricting the channel that connects over to the main Bayou de Chien stream—circled in **Figure 9**. It's not clear exactly how the ditch to the north and shoulder interact.

Recommended options are to 1) regrade the ditch and potentially upsize the channel to encourage flow or 2) negotiate with property owner so field floods instead of roadway.



Outlet Elevation



Downstream

*Figure 10: 053B00086N Inspection Photos*