

**From:** Stewart, Eric J. (Austin, TX) [<mailto:Eric.Stewart@hdrinc.com>]  
**Sent:** Wednesday, June 05, 2013 11:25 PM  
**To:** Zackary Martin; Steven Ramsey  
**Cc:** Vaugh, Sam  
**Subject:** Comal Flow Split Management - 2-24in Culvert Repair

Zac/Steve –

Pursuant to your request, we offer for review and comment the following commentary on the 24-inch culvert stabilization. This commentary is guided by the clarification offered by Nathan via email on June 3:

There are two, approximately 75 foot long, 24-inch concrete pipe culverts connecting Landa Lake and the Old Channel in the northern portion of the project site. Assessment of the outlet area of the two 24-inch culverts revealed severe undermining and stability issues. Structural deficiencies associated with the two 24-inch culverts significantly compromise their short- and long-term integrity for flow management purposes, pose a safety risk for the above ground recreational uses (golf cart path and tee box), and place the stability of the embankment forming Landa Lake at risk. Therefore at the April 3 Science Committee meeting, the project team presented conceptual design options to stabilize and/or abandon the 24in culverts. The Science Committee made the recommendation to plug and abandon the 24-inch culverts as a cost effective solution since the desired flow in the Old Channel can be maintained without them.

Subsequent to receipt of the Science Committee's recommendations, the project team developed typical sections and costs associated with plugging the culverts. The City of New Braunfels recognizes the opportunity to establish backup flow conduits at this location while achieving the Science Committee's recommendation to plug the existing culverts. A 14-inch PVC pipe could be placed in each of the existing 24-inch culverts, secured to the outside of the form work, and capped at each end with a PVC threaded cap. Concrete could then be poured in a series of lifts to plug the 24-inch culverts in and around the PVC pipes. The end caps would remain indefinitely but if temporarily removed, provide an emergency backup for the City should the Old Channel need supplemental or alternative flow. The PVC pipes could be utilized if the City needed to drain the lake in an emergency; the adjacent 48-inch culvert and gate were damaged by flood flows or out of service for repair or maintenance; or for other future management scenarios. Each 14-inch PVC pipe might be expected to convey approximately 10 cfs with Landa Lake at 621 ft-msl, or a combined discharge of up to 20 cfs.

We respectfully ask the Science Committee if there is any concern with the inclusion of two, 14-inch pipes in the plugging of the 24-inch culverts. Their inclusion addresses the Committee's recommendation and provides the City backup capacity to deliver flows to the Old Channel.

Should you have questions or require additional information, please let us know.

Thanks,  
Eric

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