

4.0 ONION CREEK RECOMMENDATIONS

October 30, 2015, marked the latest in a series of flooding disasters that have created serious property damage and loss of life along Onion Creek over the years. Prior to this, there was the Halloween Flood 2013, in which the flood waters reached a record level of 41 feet and, for the first time, severely damaged and destroyed homes in the Upper Onion Creek neighborhood in addition to lower [Onion Creek](#). The 2013 Halloween Flood had destroyed or severely damaged homes in Onion Creek at a total estimated cost of well over \$150 million, including some city services. This dollar loss was probably much higher due to the lack of complete data from the city and affected counties.

In response to the 2013 Halloween Flood on Onion Creek, the City Council had passed Resolution 20140515-028 directing the City Manager to, among other things, provide a report to Council regarding the costs associated with the purchase of homes in the Lower Onion Creek floodplain around the William Cannon Drive and Pleasant Valley Road area as well as funding options and an evaluation of the drainage fee.

The 2013 and 2015 floods resulted in a need to redraw the floodplain map, but also to look more closely at possible ways to reduce the impact of future floods and preclude the need for extensive buyouts in the future.

The goal of the current Onion Creek Floodplain and Flood Mitigation Study, in addition to redrawing the floodplain maps, was to eliminate potential inundation of buildings during a 1% annual chance event (ACE). It was determined by the consultants that a 3 to 5 foot reduction in the peak would be needed to achieve the target of reducing flood risk by 30%. The specific focus area of the Study was IH35 to E. Slaughter Lane, known as Upper Onion Creek, but we suggest that attention should continue to be directed to both Upper and Lower Onion Creek.

In reading the Study and the cover letter from Watershed, we feel that a good job has been done by Halff Engineering, but it is still preliminary and needs further work, especially concerning upstream detention and the future issues to be faced if impervious cover controls are not implemented throughout the Onion Creek floodplain. This should be considered a high priority.

Options evaluated in the study for Upper Onion Creek included:

1. Property Buyouts
2. Regional Detention
3. Flood walls
4. Channel Modifications & Clearing

5. Channel Improvements

The Preliminary Study is now complete and has examined the potential viability of temporarily diverting a significant amount of the floodwaters, then releasing them back into the creek once that major crest has fallen. Although the 2013 crest lasted less than one hour, Onion Creek residents and residences suffered extensive damage.

BUYOUTS:

If buyouts were to be viewed as the sole solution for Upper Onion Creek flooding, the Study identified 222 structures within the preliminary floodplain. It was estimated that 147 of these properties would have to be purchased at an estimated cost of \$91 million and annual maintenance costs of \$23k. It wasn't clear as to what would be done with the purchased property after it is cleared.

It should be noted that this approach would:

1. Not provide assurance against further flooding in Upper or Lower Onion Creek if further impervious cover limits are not introduced concerning development and redevelopment upstream including in Hays County)
2. Potentially damage the viability of the community through reduced property values.
3. Not, by itself, ensure any additional security for properties downstream in Lower Onion Creek.

We feel that selective buyouts should be considered in those areas hit by both the 2013 and 2015 floods, but should be approached with the objective of also improving the neighborhood and not as a total solution. We recommend the City of Austin should evaluate structures within the 25 year floodplain for possible buyouts.

REGIONAL DETENTION:

Three Centex quarries in Hays County (Centex West, Centex East Offline and Centex East Inline) were identified and studied as possible temporary retention options to hold the water.

Centex West has a capacity of 5,700 acre feet, which was estimated could retain 10% of the targeted reduction, or approximately .5-1.0 feet, of the flooding. The time in which it could be detained was not identified. Estimated cost was \$34 m.

Centex East Offline and Centex East Inline were discounted as having multiple constraints and a low viability, but no details were provided in the Report. However, a 2013 Report, also by Halff, and prepared for The Texas Water Development Board and the U.S. Army Corps of Engineers on behalf of Hays County, did identify two additional detention possibilities, Rattlesnake Falls and Dripping Springs, which indicated potential reductions of 4 to 5 feet if all three options (Centex, Rattlesnake and Dripping Springs) were combined.

Limited discussions have taken place with the owners or managers of these facilities to date.

The Bornheim Quarry, owned by the COA, fronts onto Little Bear Creek and was not considered in either Study, even though the creek flows into Onion Creek.

Based on the combination of the two studies, we feel it bears further investigation for combining potential benefits from all of the quarries, including those not identified in this Study, especially in line with the 2013 Hays County Study which indicated potential reductions in the flood levels of 4 to 5 feet in Hays County, though it could be less once joined by Little Bear Creek in Travis County. However, these reductions could possibly be improved by including the Bornheim Quarry, located along Little Bear Creek.

Antioch Recharge Facility:

While not necessarily a part of the Onion Creek Mitigation Study, the Barton Springs Edwards Aquifer Conservation District (BSEACD) is studying ways that some of the detained water in the Centex Quarry might be diverted to the Antioch Recharge Facility, thus helping to recapture the water in the Edwards Aquifer and retain it for future use. This, and other recharge facilities, should be considered as a part of this project

FLOODWALLS: (See attached map)

Floodwalls were identified as one means of eliminating the flood threat for the Upper Onion Creek Community, but would require 6,200 ft of wall along Pinehurst with heights ranging from 7 feet to a maximum 16 feet, in addition to the purchase of about 55 structures and installation of an internal drainage system to drain approximately 110 acres of local runoff.

In the Wild Dunes area, they would need 3,400 feet of wall with a height ranging from 5 to 12 feet. 31 structures would have to be purchased

In both neighborhoods, the wall would need to be relocated as closely as possible to existing structures in order to minimize the height.

Total cost for the Floodwall Option was \$80 million with annual O&M costs of \$44k. It wasn't clear as to what would be done with the purchased property after it is cleared.

We consider this option to be the most destructive of the options:

1. It would still result in the purchase of 86 properties ,

2. Quality of life and property value could be seriously diminished for those directly behind the walls
3. Overall property values through the Onion Creek neighborhoods and resultant property tax revenues to the COA and Travis County could be greatly reduced.
4. Increased flow downstream could further increase future flood problems and potential buyouts in Lower Onion Creek.

CHANNEL MODIFICATIONS AND CLEARING:

CHANNEL CLEARING: According to the 2016 Study, totally clearing the channels and immediate overbanks can be considered an effective alternative to reducing flood elevations as it allows the water to run more freely and was estimated to decrease the water levels by up to 2.0 feet in the Wild Dunes area. There is also a potential benefit due to a reduction of fire threats in the area with the removal of the dead brush. However, efforts to clear and maintain the “cleared” channel would also potentially impact the riparian corridor along Onion Creek and cost approximately \$11.2m with an estimated additional \$1m in annual O&M costs as well as increase erosion.

REMOVE CONSTRICTIONS: Selective efforts, such as excavating the channel below the River Plantation Bridge, could provide benefits by increasing the opening and reducing the water elevations in the Wild Dunes area. The result could also be to increase erosion. The impact of this increased flow on Lower Onion Creek must also be evaluated.

CHANNEL BENCHING: This option would result in increased velocity of water flow and could potentially be very erosive.

CHANNEL IMPROVEMENTS: Combining the channel alternatives does offer potential, but should be further evaluated in the final engineering analysis. Regular maintenance would be required and initial cost is estimated at \$74m, but water surface decreases of 1.4 – 2.7 ft in the Pinehurst area and 2.5-4.0 ft in the Wild Dunes area make it worth further investigation and, combined with the quarry alternatives, might achieve the mitigation goal. Once again, water velocity would be increased so the impact on Lower Onion Creek should also be considered.

While these recommendations are directed primarily towards Upper Onion Creek, they are made with the understanding that current efforts to complete the Lower Onion Creek Buyouts will be completed as quickly as possible.

RECOMMENDATIONS:

1. **Specific steps for mediating the flood risk in Onion Creek:**
 - a. **Clean and regularly maintain the Creek.**

- Lower Onion Creek. This is something that needs to be conveyed to Hays and Blanco Counties as well.**
- 9. Create an Onion Creek Flood Control District to manage the Onion Creek Floodplain. Potential partners include BSEACD, Hays County, Travis County and LCRA.**
 - 10. Appoint representatives from both Lower and Upper Onion Creek to join the Halff Study Team as full members of the ongoing study team to formalize plans and provide community input and support.**
 - 10. Coordinate area early warning systems with strategically placed flood-hardened gauges to include all streams and creeks feeding into the Onion Creek watershed.**

POTENTIAL FUNDING/ PARTNER RESOURCES:

For any far-reaching solution to be successful in solving the Onion Creek flooding problems, it is essential to form partnerships with the other potential stakeholders. Onion Creek is not just a local Austin problem; it extends upstream into Hays and Blanco Counties and even has an impact downstream as it flows into the Colorado River just above Bastrop.

- 1. LCRA**
- 2. Texas Water Development Board**
- 3. State of Texas**
- 4. Hays, Travis & Blanco Counties**
- 5. U.S. Army Corps of Engineers**
- 6. FEMA**
- 7. Creation of Onion Creek Flood Control District**
- 8. Bonds**
- 9. Barton Springs Edwards Aquifer Conservation District (BSEACD)**
- 10. Other potential sources of funding (as referenced in Section 6)**