LID 7

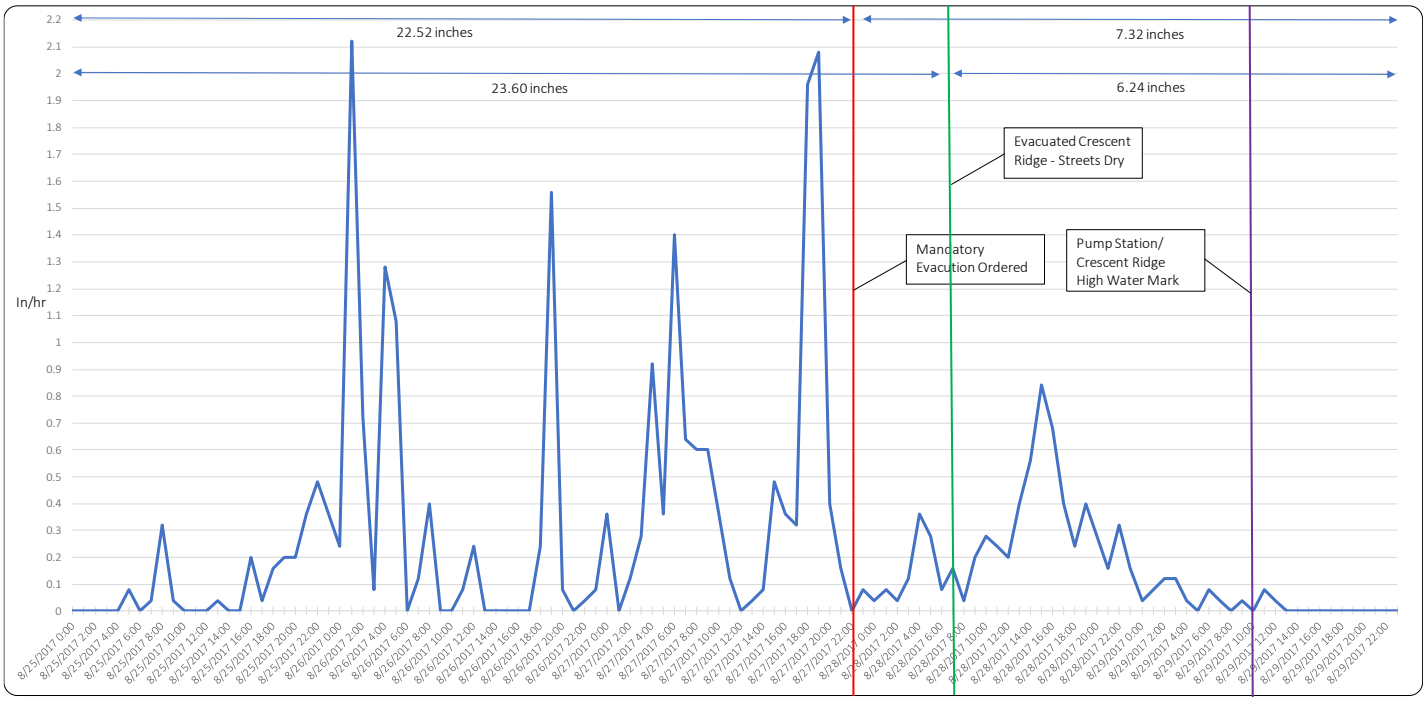
Pump Station Assessment
During Hurricane Harvey
Aug 25 – Sep 1, 2017

V 1.0

Oct 3, 2018

1 Rainfall Totals

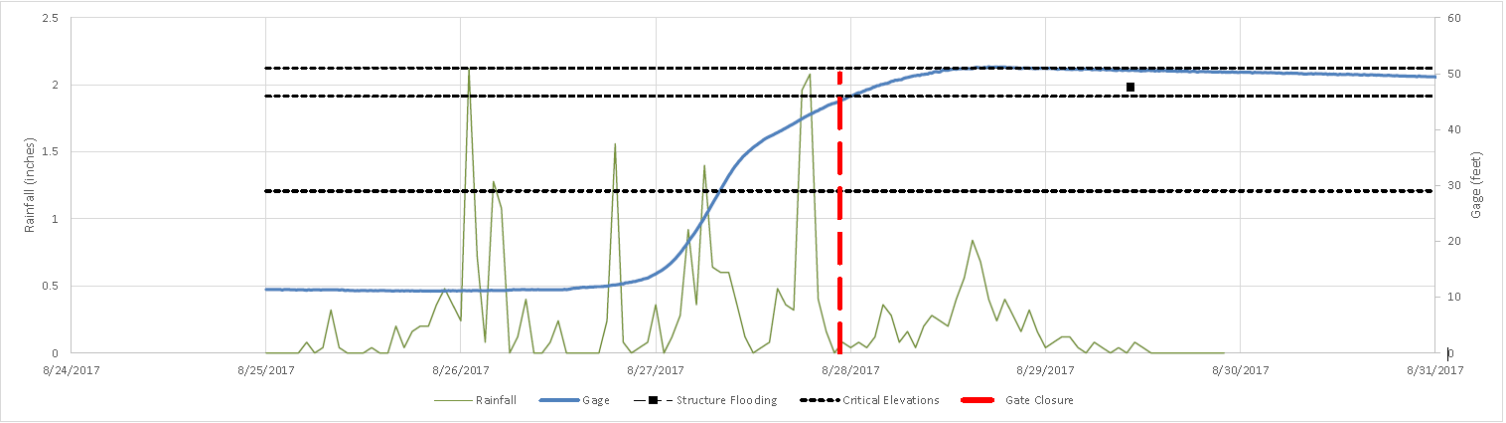
The following graph is based on rain amounts as measured by TxDOTs weather gauge on the Jodie Stavinoha Bridge.



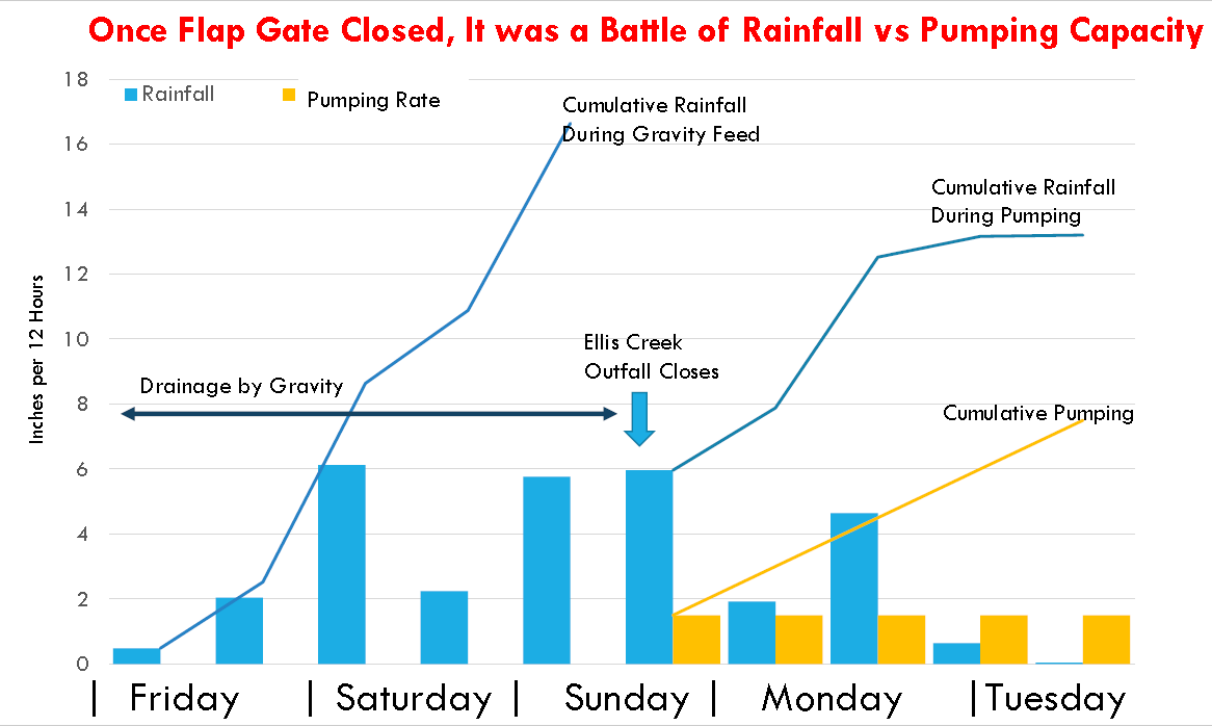
- Red line – mandatory evacuation ordered.
- Green line - Crescent Ridge resident observes the entrance and intersection as being dry.
- Purple line - high water mark as observed 28 hours later. (See photos in section 3.2)

While additional rain did fall over this timeperiod, the observations strongly suggest the high water was a result of Ellis Creek backing up into the Crescent Ridge neighborhood.

Costello Diagram



While a cumulative total of between 30-34 in of rain fell. Flooding within LID 7 was a result of 14 in (or possibly 20 in) of rain which fell after the Brazos river closed the pump stations flap gates.



2 Pump Station

Observations

Tuesday AM (8-29)

- Ellis Creek levels peak at pump station. Only top section of gates remained above water. Only top horizontal bars exposed at pump inlet.
- Water touches bottom of West Meadow bridge.
- 4 ft. of water at Crescent Ridge entrance. This is the deepest level of water in neighborhood, though many streets impassible.

Wednesday AM (8-29)

- Pump station water level down about 12 in.
- All four pumps (25,000 GPH) ran for at least 7 hours, but eventually they tripped and went off line. Operators waited 20 minutes and then brought up 2 pumps. They continue to rotate running 2 pumps at a time.
- Power was never lost at the pump station.

Conclusions

- The pump station pumps were just able to keep up. Additional rainfall would probably have resulted in addition East side homes flooding.
- All four pumps cannot be run reliably for extended periods.

Recommendations

- Perform following pump station upgrades are recommended in Schrader study. Including,
    - Update wiring so that all 4 pumps can be run by generator. There still may be a restriction that only 3 pumps can run concurrently by generator.
    - Resolve issues preventing all four pumps from running simultaneously using grid power.
    - Install solid state control system.
- Expand existing pump station capacity:
    - Add three 30-35,000 GPM pumps..
    - Total capacity approximately 200,000 GPM (up from 88,000 GPM).

Peak water levels - Tue 8-29 10:45 AM

Approx. 5 ft freeboard within concrete pump box
4 x 22,000 GPM pumps

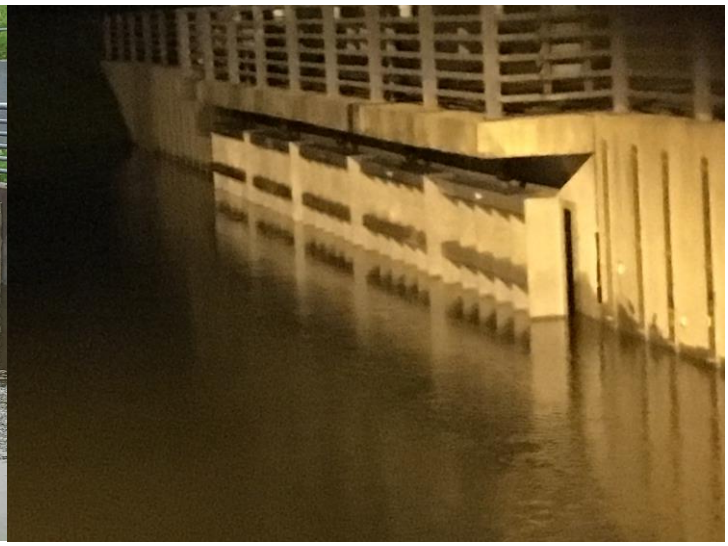
External channel (behind pump station facing S)

External channel (behind pump station facing N)

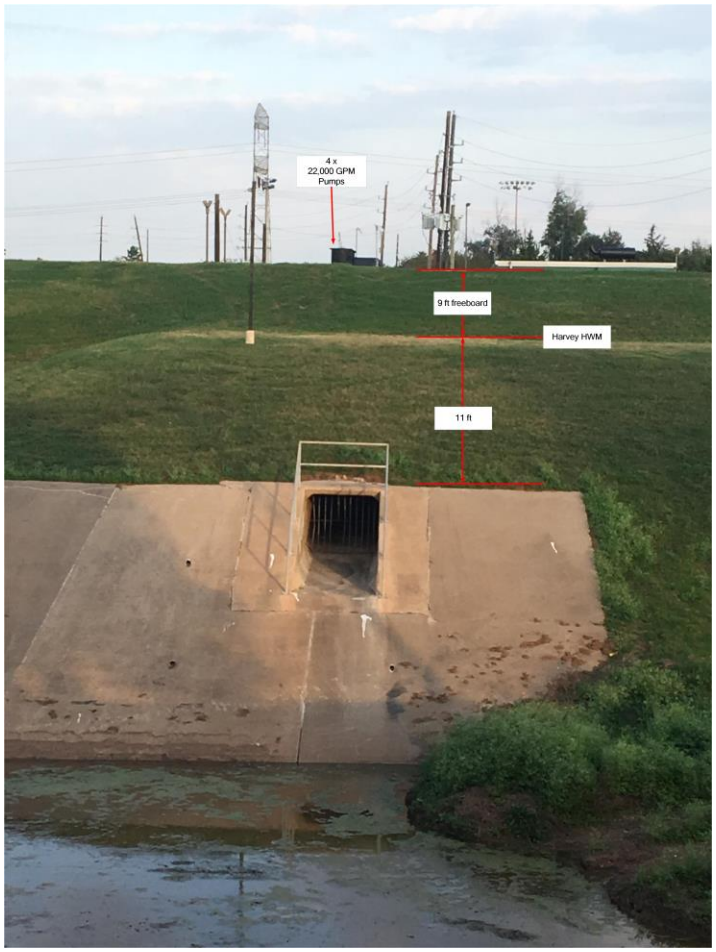
Pumps station inlet (facing east) – Tue 8-29 10:45 AM

West Meadow bridge at recycled water plant.

Peak water levels - Tue 8-29 10:45 AM



Dropped water levels – Wed 8-30 5:30 AM
(19 hr 45 min of pumping – approx. 12 in.)



Pump outflow culvert was approximately 11 ft under water at the Harvey HWM.

LID 7 – Harvey HWM

LID 7 Pump Station