



LEVEE IMPROVEMENT DISTRICT #15

HURRICANE HARVEY 2017

Levee Management Services
Post Harvey Summary Report



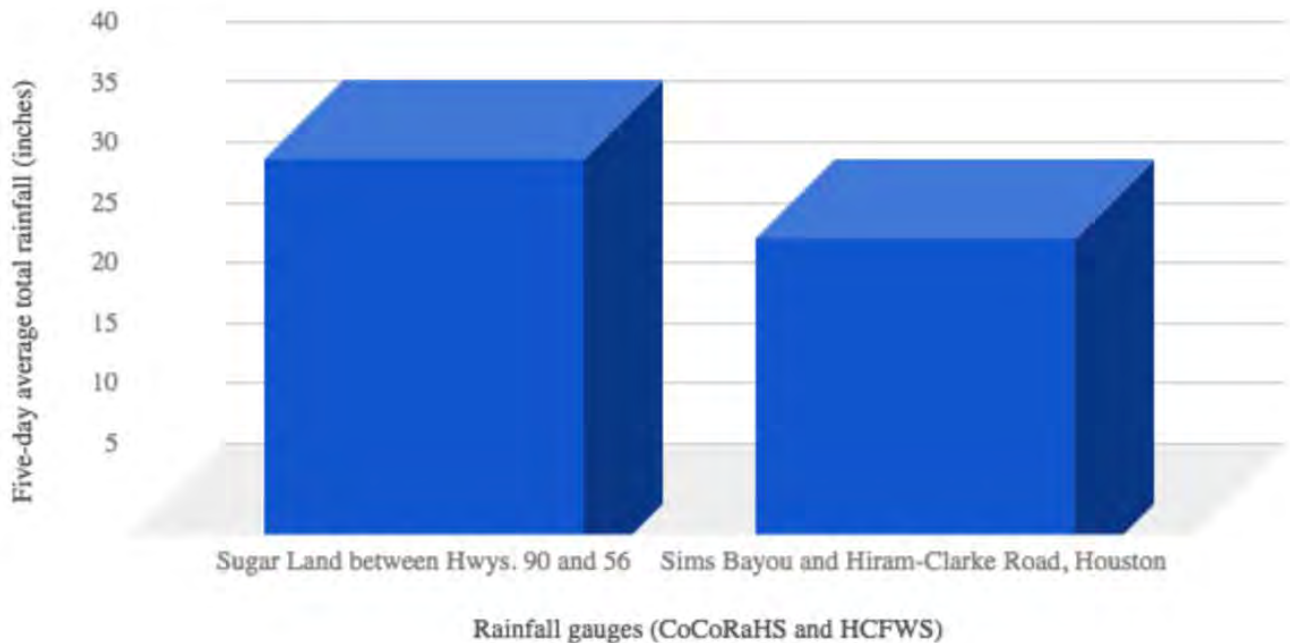
Hurricane Harvey

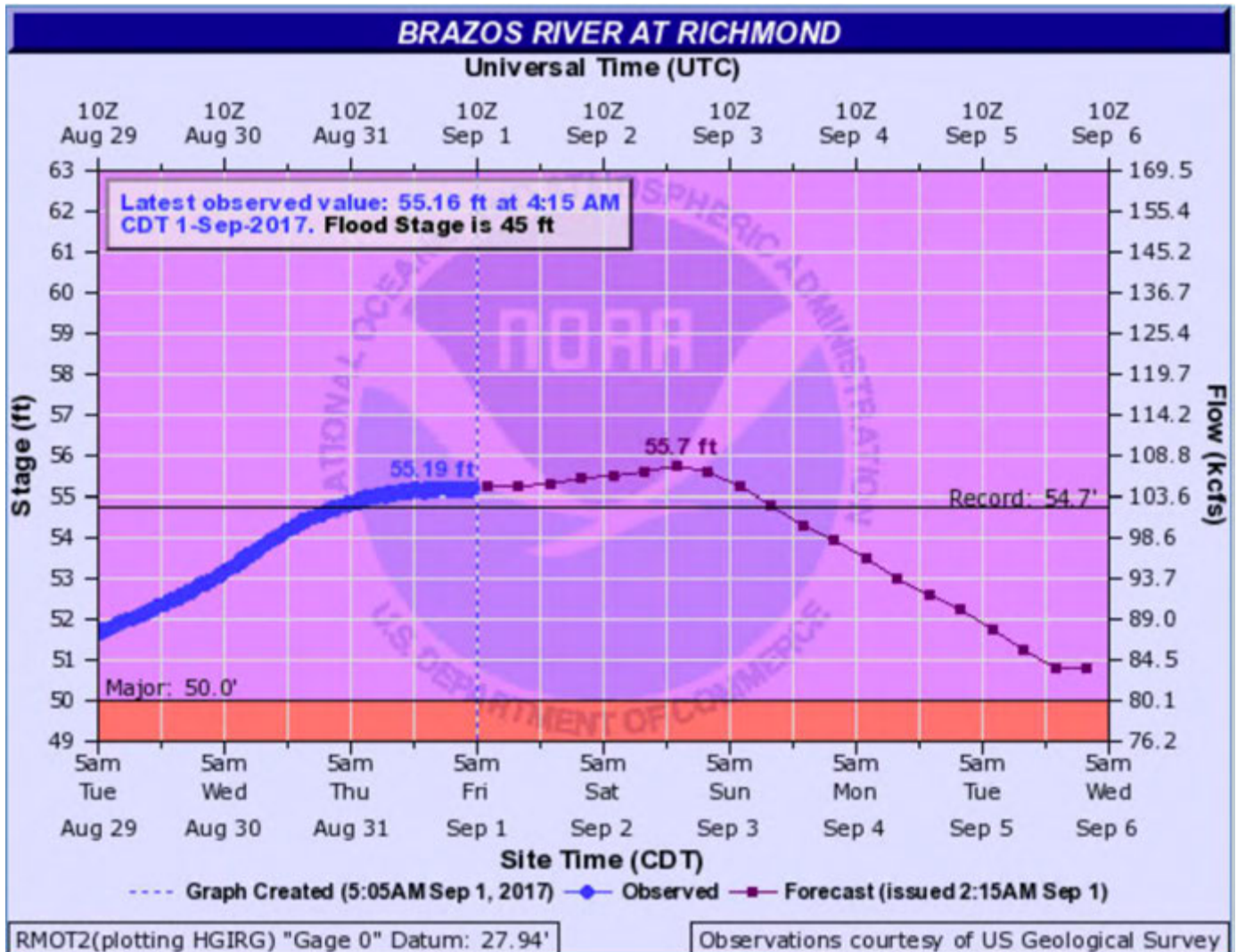
Executive Summary

Hurricane Harvey made landfall around 10:00pm CST on August 25th, 2017 between Port Aransas and Port O'Connor, Texas as a category 4. Harvey is the strongest hurricane to impact Texas since 1961 and the first category 4 storm to make landfall in the United States since Hurricane Charley in 2004. Rainfall in the Sugar Land/Missouri City area totaled in the 34-40-inch range which tested the Riverstone Community drainage facilities to their maximum capabilities.

Sugar Land/Missouri City

Aug. 26-30, 2017





Prior to the Storm:

Levee Management Services crews and personnel completed a final inspection of the levee and drainage system to insure all water ways were clear for proper drainage for the upcoming rainfall. LMS found no obstructions or areas of concern prior to Harvey. All outfall structures, LID detention areas, ditches and channel ways were all clear prior to the event. Pump Station, although brand new, was checked and inspected for proper operation prior to the storm. LMS personnel was in communication with local jurisdictions to share information of the LID status as well as hear updates that the Fort Bend County OEM was getting from the National Weather Service.



During the Storm:

As Harvey approached the Riverstone area, LMS per the EAP, began inspections of all drainage facilities to insure no new blockages impeded future water flow. A temporary pump was brought in at Snake Slough to help handle some internal water level issues noticed in the storms passed. The pump was up and operational by Friday 8/25. A tornado on Friday 8/25 made land fall at the end of Private Rd and the Levee which caused an uproot of trees and signage in the area but caused no damage to the levee. As the rain continued and the Brazos River began to rise, the internal water drained out per gravity flow as designed with no issues. As the river continued to rise, LID 15 lost gravity flow on Monday 8/28 at 1:00am and LMS began emergency pumping operations, manning the pump station 24 hours a day until internal water levels were back at normal and gates were open again on 9/4.

What was learned:

With unprecedented rainfall amounts in a short-day span, road closures made it very challenging for LMS employees to maneuver throughout the district by normal transportation. W. Avalon Drive was inaccessible for a two-day period which made getting employees in and out of the pump station a challenge, and transportation was switched to high water vehicles. The Pump Station, although operational on normal power and manned the entire time, was not suited for housing an operator full time and requests will be made to the Board of Directors for improvements.

After the Storm:

A full inspection of the district has been completed Post-Harvey. Below is the report by LMS for status of levee and action moving forward. The sections of the report have been split up by segment of Levee, Outfalls, Pump Station and Drainage.

Levee System:

After detailed inspection, no issues were found on the levee in LID 15. No signs of erosion, sloughing or structure damage. Minor hog damage has been noticed after the event, but no serious issues of concern at this time. Grass stand on the South West section of levee is rather light from frequency of inspection during the storm event. LMS has already coordinated with the district's vegetation contractor for treatment. High water marks have been taken for the new Brazos River record of the 55.2 crest.









































Outfall Structures and Drainage:

After complete inspection on LID 15 Outfall Structures, no drainage facilities were damaged or collapsed after the heavy rains and river elevations. Extensive clean up throughout the district will take place to clear of silt and debris from concrete structures and open ended pipes to ensure proper drainage in the future. All sluice and flap gates were inspected for damages to gates and hardware. No damages are present on any structure and all gates have been completely cleared of trash, regreased and exercised for proper operation for future events. Down limbs and trees that ended up around the concrete structures have been removed and outfall weep holes that were clogged due to high water, will be cleared in the near future for proper operation of the structure. Two outfall structure's drainage ditches will need desilted after the event to allow for no further standing water in the basin. All drainage facilities in the district did not receive any damage from the rain and river events in this disaster.







































Pump Station:

A full inspection of the pump station has been completed by both LMS and the pump station contractors after Hurricane Harvey. The pump station is in full working order; however, two storm water pump control boxes will need reworked as it was noticed some water in the electrical panel which could cause an electrical short if used in the future. Although the station never lost power, a complete work up on the generator was completed as well to ensure future operation. The computer system in the pump station that monitors pump station operations was not operating as designed as it was not commissioned yet before the storm. Adjustments on the computer monitoring system will need to be made before it is fully operational. The intake tunnel for the pump station worked as designed, however, operator will recommend a bar screen be installed to keep debris from going into the tunnel during operation. A board request will be made to prevent damage to the pumps in the future. Also noticed during the storm is the access from the pump station to the levee is very limited. Operator will also recommend a driveway from the pump station building to the levee top be installed for access as well as a working space should additional temporary pumps ever have to be brought in to assist in pumping operations.





Alcorn Bayou Drainage:

LMS completed a detailed inspection of Alcorn Bayou after Harvey. There are several areas that have down trees and limbs from the storms and water levels experienced during Harvey. An abundance of trash and debris has been left throughout the channel from natural drainage as the water receded in the district. LMS has already contracted to begin clean up in the channel and this work will continue throughout the rest of the year.















In Conclusion:

Levee Improvement District 15 overall is in great shape after the disaster of Hurricane Harvey. Clean up and maintenance work throughout the district has already commenced and will proceed throughout the rest of the year. LMS has already handled all the main priority items to ensure that the district is always ready for the next storm, whenever it may occur. The rest of the clean-up and general maintenance will continue under the allotted contract hours we have agreed upon with the LID.

Moving forward in LID 15, LMS has a list of improvements on the operations side that will be requested to the board of directors to help handle future rain and river events.

1. Request hard topping levee in certain areas to help assist operator in inspections and staging areas throughout the district.
2. Rework district Emergency Action Plan to add now learned areas of concern for high water during an extreme rainfall event. Possibility of bringing in temporary pumps to areas now known as areas that take on water more quickly than others while permanent repairs are being designed by district engineers.
3. Pump Station driveway to levee top for access and staging area of possible temporary pumps should they ever be needed to help assist in pumping operations.
4. Pump Station housing for operators during an extreme event.
5. Request rain and river gauges at district outfall structures.
6. Request lighting package at the pump station to help assist in pumping operations.
7. Expand video camera capabilities to show water levels throughout outfall structures.
8. Request with permit holders on ways to improve Alcorn Bayou drainage.