

Church Creek Drainage Basin Meeting

Drayton Hall Elementary School

December 10, 2015

Questions and Responses

- 1. Was the work on the West Ashley Traffic Circle in compliance USACOE Permits?** Charleston County confirmed that construction occurred in compliance with permits issued for the project by the US Army Corps of Engineers.
- 2. Does the county acknowledge the additional stormwater flow that now feeds into Hialeah Court as a result of the construction of West Ashley Circle.?** Yes, the county and the designer are aware that stormwater from the inside of the circle began to flow in reverse direction up a crossline pipe which ultimately leads to a ditch along Hialeah Court during heavy and normal rainfall events. This unintentionally happened as a result of an existing crest in the inside of the circle which naturally forced the flow through the crossline pipe. The county has made intermediate repairs by plugging the pipe and cutting through the crest within the construction limits to force the stormwater to the box at the Bees Ferry Road intersection which was the intent of the original design. The designer is now working on permanent revisions to ensure water will not travel from the inside of the circle to the ditch along Hialeah Court.
- 3. What are the plans for commercial development around the West Ashley Traffic Circle?** Development around the West Ashley Circle (WAC) is enabled and zoned for a variety of uses and will be subject to all of the City's regular development review processes, including review by the Design Review Board and Technical Review Committee, which includes the City's standard practices for stormwater management. Due to its location, any development in the WAC will be subject to the stringent Church Creek Special Stormwater Management Area requirements.
- 4. What are the plans for the Long Savannah Development Water Shed?** Water is mostly contained in the Rantowles Watershed. Development in Long Savannah is subject to the plans as outlined in the Long Savannah Development Agreement which was approved by Planning Commission and City Council. As stated in Section 5.5 of this Development Agreement, "It is estimated that approximately two hundred (200) acres of

the Property is within the Church Creek Watershed, a drainage basin that has been designated by the City as the Church Creek Special Stormwater Management Area. The Developer commits to providing a storm drainage network that will drain the Property located within the Church Creek Watershed, as may be viable with the existing topography, towards Rantowles Creek, and in addition the Developer will use all reasonable efforts to work with adjoining property owners as may be practical to provide an opportunity for adjacent properties located within the Church Creek Watershed to drain their property, as may be viable with the existing topography and with the development plans for the Property, towards Rantowles Creek.”

The full text of this document is available online at

<http://www.charleston-sc.gov/AgendaCenter/ViewFile/Agenda/03182015-1197>

5. **Who is responsible for the weir in Lake Dotter?** The Parks Department manages this control structure on a daily basis. Periodically, especially during times of heavy rain or during perigean (king) tides, the lake is unable to be drained due to elevated water surface elevations in Church Creek.
6. **Given the recent flooding and the ingress/egress issues, does the City have adequate rescue equipment to respond in flood situations?** This is a very broad question which cannot be answered with a simple yes/no. For the general flooding that we see as a result of high tides and typical thunderstorms, either separately or in conjunction with one another, the answer is that we are prepared.

Given the magnitude of the October 2015 flooding, the city did not respond as a stand-alone agency. We did call on additional resources from agencies throughout the state to address any deficiencies in equipment and trained personnel. Given the circumstances, all responses were handled safely and in a timely manner. This request for additional assistance is typical for fire/rescue agencies. We called for assistance well in advance of the need for additional rescue resources which positioned us in a ready response state.

As we prepare for the certainty of more frequent flooding and the impacts of sea level rise the Charleston Fire Department will continue to address the need for specialized equipment and training to continue to provide a very high level of service to our community. These resources will position us to either help others or be prepared to handle situations when outside agency resources have already been committed elsewhere.

7. **Why was Mr. Whitfield allowed to cut trees and fill wetlands?** Mr. Whitfield applied for a variance and special exception to the Board of Zoning Appeals to remove trees within an area formerly utilized as phosphate mine. Variances were granted. Any filling of wetlands would have had to been approved by the US Army Corps of Engineers.

8. **Would the city consider a moratorium on development?** Typically a moratorium is defined for a specific period of time to allow a jurisdiction to study a specific issue. In 2000, a moratorium was put in place for 9 months to allow the city time to develop specific regulations for the Church Creek watershed and to identify flood control projects. The development regulations put in place in the Church Creek basin have been effective based on our observations of the flood levels associated with the various rainfall events. We do not feel that a moratorium is warranted and can easily be challenged by property owners that today already have special development requirements in place to mitigate impacts associated with development within currently undeveloped property.
9. **What is the process for permitting and approval of development in the Church Creek Basin?** In general, the process for permitting and approval of development within the Church Creek Basin is the same as that for other areas of the city with one major exception. The city has developed specific stormwater design standards that are based on the actual physical characteristics and floodplain for this basin. Within the Church Creek Special Stormwater Management Area, all permanent stormwater management systems associated with new development shall be designed and constructed to maintain the post-development peak flow rates at or below the pre-development peak flow rates, and to detain the excess runoff volume difference between the pre-development and post-development conditions for the design storm having a duration of 24-hours and frequencies of 2, 10, 25, 50 and 100 years for a period of twenty-four (24) hours.
10. **How is construction monitored during development?** Prior to construction the contractor, engineer, city staff and others as needed hold a pre-construction meeting to review the sequence of construction and the Construction Stormwater Pollution Prevention Plan (C-SWPPP). The developer's contractor is required to comply with the approved plan and the city makes periodic inspections to document the contractor's compliance or deviation thereof. The city also responds to reports of non-compliance during construction and can take enforcement action if necessary. At completion of the project the developer is required to submit as-built drawings to demonstrate that the project was constructed as designed and that stormwater controls will function as intended.
11. **How often is the model updated?** The basin model is updated on an as-needed basis triggered by development within the drainage basin. The most recent update occurred in August 2015 spurred by the recent developments. Prior to that, the model was updated in 2010 for the LOMR (Letter of Map Revision) submittal to FEMA. Both the West Ashley Traffic Circle and the Bee Ferry Road widening project were modeled prior to

construction to ensure they did not adversely affect the basin and as-built information has been incorporated in the most recent model update.

- 12. What trend does climate data for the last 8-10 years show and what will the city do to address the projected increase in rainfall?** Recent rainfall and tidal data compiled by the City depicts highly infrequent conditions historically, that have occurred relatively frequently over the last several years. The City of Charleston recently presented its strategy for sea level rise. During the research for this plan city staff had a number of discussions with representatives of NOAA and DHEC that study and present the science that addresses sea levels, climate change and rainfall data. The city will continue to monitor the science that applies to anticipated changes in climate and modify design standards for construction as necessary.
- 13. How is the Sienna Pond outfall into the wetlands and the SCE&G right-of-way being addressed?** It is the city's understanding that the outfall from the pond drains into the SCE&G right-of-way and is causing more frequent inundated conditions within the wetland. Woolpert, the city's consultant for the drainage basin, has proposed a potential solution to convey an equivalent discharge volume from the area. It is currently in the conceptual stage and details still need to be worked out.
- 14. Are the 36" HDPE pipes under the road downstream of railroad tracks an obstruction?** Woolpert will be modeling the effects of those pipes. However, based on how closely empirical data (i.e. high water marks) collected from the most recent heavy rain events supports the model predictions, the pipes have little to no effect on drainage conditions in these larger events. Basically, there is very little additional fill between the pipes and the top of the roadway. Therefore, when the pipe capacity is exceeded the water simply tops the road without further restriction or additional impact upstream.
- 15. Should the pipes under the railroad tracks be replaced with box culverts?** The pipes under the RR tracks downstream of the Bees Ferry Road bridge appear to be functioning adequately with losses (changes in water surface elevation between the pipes inlets and outlets) ranging from 0.13-ft for the 50% rain event to 0.52-ft for the 1% rain event. These culverts together already have a higher capacity than some portions of the system upstream. In addition to these culverts there are 2 other nearby locations where multiple culverts drain under the railroad. The culvert installed most recently is in fact an 8 ft. by 4 ft. box culvert that the city installed to intercept and divert approximately one third of the stormwater runoff from Shadowmoss directly to a lower stretch of Church Creek, basically bypassing drainage systems that serve the lower areas of Shadowmoss and the Hickory Hill neighborhood. There are a total of 11 culverts under the RR between Glenn McConnell Parkway and Ashley River Road.

16. **Does the Doncaster Canal (Hickory Hill Canal) need to be excavated?** The canal is primarily a conveyance structure and provides very little storage. Any storage that is available is above the typical water surface elevation (WSE). Seeing as the WSE is influenced by the tide, excavating the canal would simply allow the extra volume created to be filled with tidal water not gaining any net benefit.

17. **Is a pumping system an option?** The city has considered many different options to alleviate flooding in the Church Creek basin and a pump station was one of them. The challenges with a pumped system include the size of the collection system needed to convey the water to the pump station and similarly the size of the discharge system that would be required to transport the pumped water to the Ashley River. The volume of water concentrated in the Church Creek basin and the distance to the Ashley River makes a pumped solution infeasible. In addition, pumps can fail and pipes can become clogged. A better long term solution for residents may be to remove those properties from the limits of the floodplain.

18. **What are we going to do to eliminate flooding like the kind we experienced in August and October?** The properties that were affected by flooding during these rain events are in the 1% (100-year) floodplain, which is an area known to flood and had finished floor elevations below the level of the 100-year flood levels. The rain events of August 2015 and October 2015 were very significant events. On August 31, 2015 we experienced 6.13 inches of rain in 3 hours and a total of 7.24 inches of rain in the 24-hour period. In October we recorded 11.85 inches of rain in 24-hours and 17.28 inches during the 4-day rain event. Modifications which would lower the flood elevation during rain events this significant are not practical nor has the city been able to identify modifications which would lower the floodwater elevation. The city is committed to doing what it can to see that the level of flooding in the basin does not increase and that resources are provided to:

- Remove repetitive loss properties from the floodplain
- Provide regularly scheduled and frequent maintenance to the drainage system to remove obstructions and support stormwater flowing efficiently through the system
- Drafting additional development requirements that will prevent the filling of lands within the 100-year floodplain and thus, the potential displacement of floodwaters to new areas

- Continue to ensure that the basin is developed according to the strict Church Creek Special Stormwater Management Area requirements.

It should be noted that the flooding caused by the excessive 4-day rain event was widespread and occurred in areas throughout the state. 2015 has turned out to be the wettest year on record as measured at the Charleston International Airport with 74.89 inches of rain, which is almost 21 inches or nearly 50% more than the average annual rainfall for the area. We are still feeling the effects of the record rainfall totals that occurred in 2015 demonstrated by elevated groundwater levels and wetlands that are swollen beyond normal boundaries. A prolonged dry period, warmer spring weather and uptake by trees and vegetation that are dormant in the winter are conditions that will help to reduce standing water levels.