# Hancock County Flood Risk Reduction Program Update

May 5, 2017

#### Presentation

## Project Overview

## Stantec's Work

- Project Refinements
- Project Alternatives
- Opinions of Probable Cost
- Benefits & Impacts Summary
- BCR





Blanchard St. Bridge

## **Project Overview**





#### Our Challenge

Larger floods have occurred more frequently





Lower the 1% ACE event water surface elevation at Main Street and other major egress routes to permit passage of emergency response vehicles (6"-9" maximum water depth)

Stated Project Objective



#### Concept Design Analysis

Size Alignment Profile Inlet Location



### **USACE Diversion Channel Refinement**



Concept Design Refinement

Western Diversion of Eagle Creek

## **Preliminary Recommendations**

- This Alternative is Feasible
- Relocate entrance and reduce channel length
- At-grade intersection with Aurand Run
- Refine profile
  - Reduce overall excavation & waste
  - Reduce rock excavation
- Update Capacity from 25-year to 100-year flows





## Why Alternatives?

## **Remaining Problems to Solve**

**Residual Risk of Project** 

## **Double-Peaked Hydrograph**



### **Residual Risk**

The Blanchard River Watershed





#### **Residual Risk**

15% of Watershed Influenced if Only Eagle Creek is Addressed





#### 1% ACE Double Peak



Stantec

## **Alternatives**



Remove Inline Riffles/Dams

Floodplain Bench Widening

> Bridge Modifications

Currently in MWCD Official Plan

Stantec

## **Hydraulic Improvements**



Remove Inline Riffles/Dams

Floodplain Bench Widening

> Bridge Modifications

Currently in MWCD Official Plan

Stantec

## **Hydraulic Improvements**



#### Percent of Watershed Influenced





#### Opinions of Probable Cost

Spatial Spread of Projects

Independent Projects that make up a Program



### **Alternatives**

Alternative	Base Cost	Cost With Contingency	
Alternative o – Existing Conditions			
Alternative 1 – USACE Plan (25-Year Diversion of Eagle Creek)	\$63,804,000	\$80,902,000	
Alternative 2 – Blanchard River Modifications	\$15,280,000	\$19,864,000	
Alternative 3 – Alt. 2 + Eagle Creek Dry Storage Basin	\$68,780,000	\$89,414,000	
Alternative 4 – Alt. 3 + Blanchard & Potato Dry Storage Basins	\$122,880,000	\$159,744,000	

Alternative 4 is Stantec's Recommended Plan

- Hydraulic improvements
- Eagle Creek dry storage basin
- Blanchard River dry storage basin
- Potato Run dry storage basin

#### **Benefits and Impacts Summary**

Alternative	Modeled Scenario	Reduction in WSE at Main St (Feet)	Max Water Depth on Main St (Feet)	Duration Water is 6" Above Main St (Hours)	Total Acres Directly Impacted by Project Construction	Home Buyouts	New Bridges or Cul- De-Sacs	Acres Impacted Outside of Ex. Regulatory Floodplain	Acres Removed from Floodplain	Agricultural Acres Removed from Floodplain	Parcels Directly Impacted by Project Construction	Parcels Removed from Floodplain
0	Existing Conditions	n/a	4.6	50								
	USACE Plan (25-Yr Diversion)	0.9	3.6	45	960	1	13	960	1,690	1,140	75	1,670
	Blanchard R. Modifications	0.9	3.7	40	2	0	0	2	280	40	5	760
3	Blanchard R. + Eagle Cr. Storage	2.8	1.8	35	1,140	14	1	863	2,780	1,180	55	2,460
4	Blanchard R. + Eagle Cr. Storage + Blanchard & Potato Storage	3.6	1	15	2,430	19	2	1,514	5,060	2,850	135	2,850

Benefit / Impact Summary HEC-RAS Results (SCS Type II – NOAA Atlas 14 100-Year, 24-Hour event (5.26 inches) equally distributed across watershed)

#### Hancock County Flood Risk Reduction Program: Benefit Cost Analysis

(STANTEC Project # 174316204)

Prepared for: Stantec

#### Submitted by:



#### Point of Contact:

Michael F. Lawrence, JFA President 4915 Saint Elmo Avenue, Suite 205 Bethesda, Maryland 20814 Phone: (301) 961-8835 Fax: (301) 469-3001 <u>lawrence@ifaucett.com</u>

March 2017

#### **Opinion of Probable Construction Cost**

Alternative Option	Base Cost	Cost With 30% Contingency	
Riffle/Inline Structures Removal	\$780,000	\$1,014,000	
Floodplain Bench Widening and Railroad Bridge Modifications	\$14,500,000	\$18,850,000	
Total Hydraulic Improvements	\$15,280,000	\$19,864,000	
Eagle Creek Dry Storage Basin	\$53,500,000	\$69,550,000	
Blanchard River Dry Storage Basin	\$34,400,000	\$44,720,000	
Potato Run Dry Storage Basin	\$19,700,000	\$25,610,000	
Total Storage	\$107,600,000	\$139,880,000	

#### Operations and Maintenance Cost:

- Hydraulic Improvements \$17,700 annually
  - Mowing, debris removal
- Dry Storage Basins \$155,000 annually
  - Annual inspections, EAP updates, mowing, embankment repair, debris removal

## Benefit-Cost Analysis



## Hydraulic Improvements

#### Costs / Benefits - NPV (Thousands of 2017 Dollars)

Category	Cost	Benefit	Benefit- Cost Ratio
Program Costs	\$20,233		
Structures (Residential)		\$33,896	
Structures (Business)		\$24,901	
Motor Vehicles		\$2,523	
ransportation		\$5,969	
mergency Response		\$4,050	
NFIP Administrative Cost		\$5,698	
Business Losses (Income)		\$2,067	
Business Losses (Cleanup)		\$2,673	
Business Losses Emergency Plan		\$797	
Agricultural		\$163	
invironmental		\$11,229	
otal	\$20,233	\$93,966	4.64



#### 1% ACE Flood

Hydraulic Improvements Only







	1		10	Mile	s
0 0.350.7	1.4	2.1	2.8	3.5	