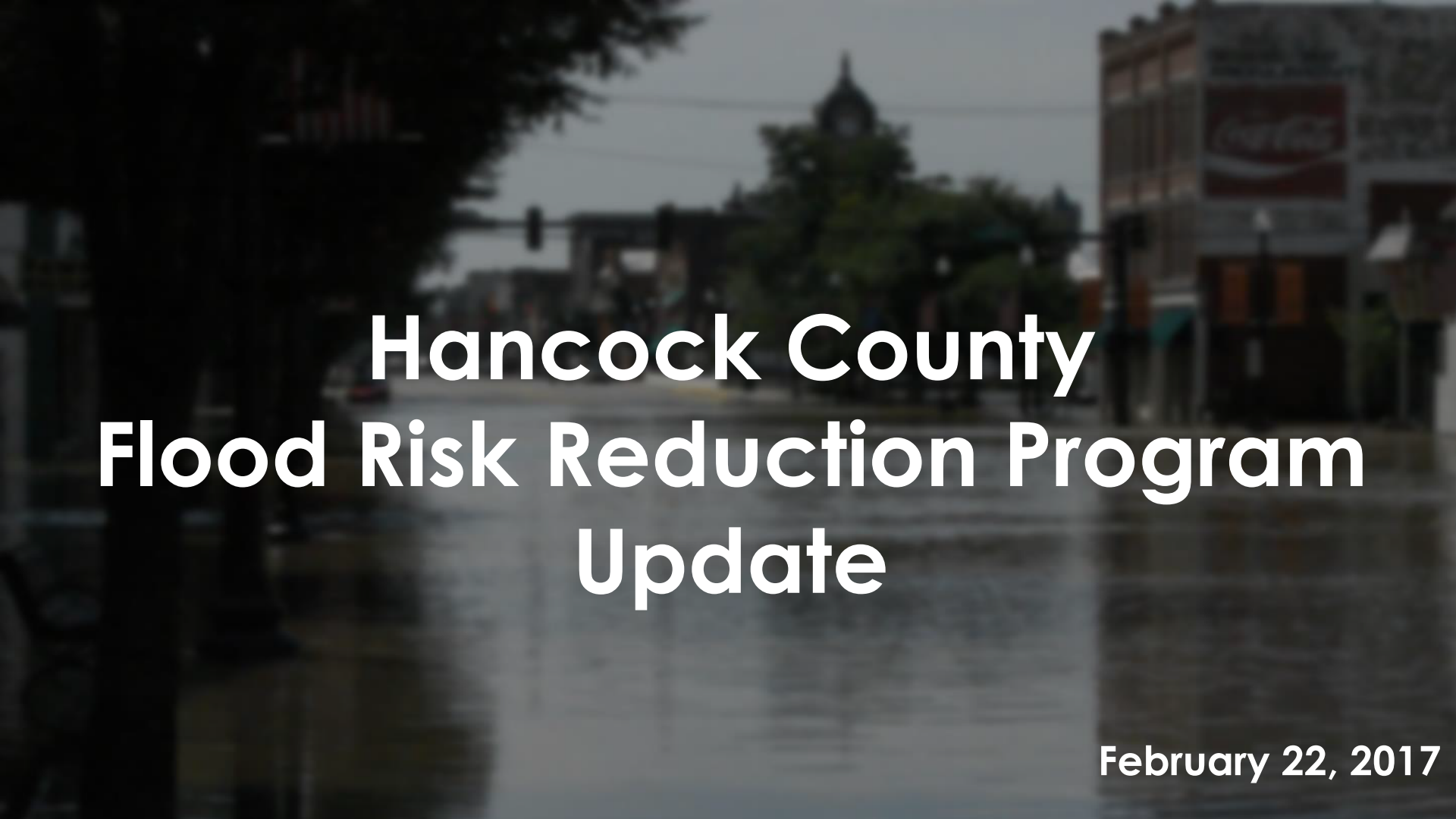


Hancock County Flood Risk Reduction Program Update

February 22, 2017

Introductions

Clark Lynn Army: MWCD General Manager

Steve Wilson: MWCD Project Manager

MWCD Board of Directors

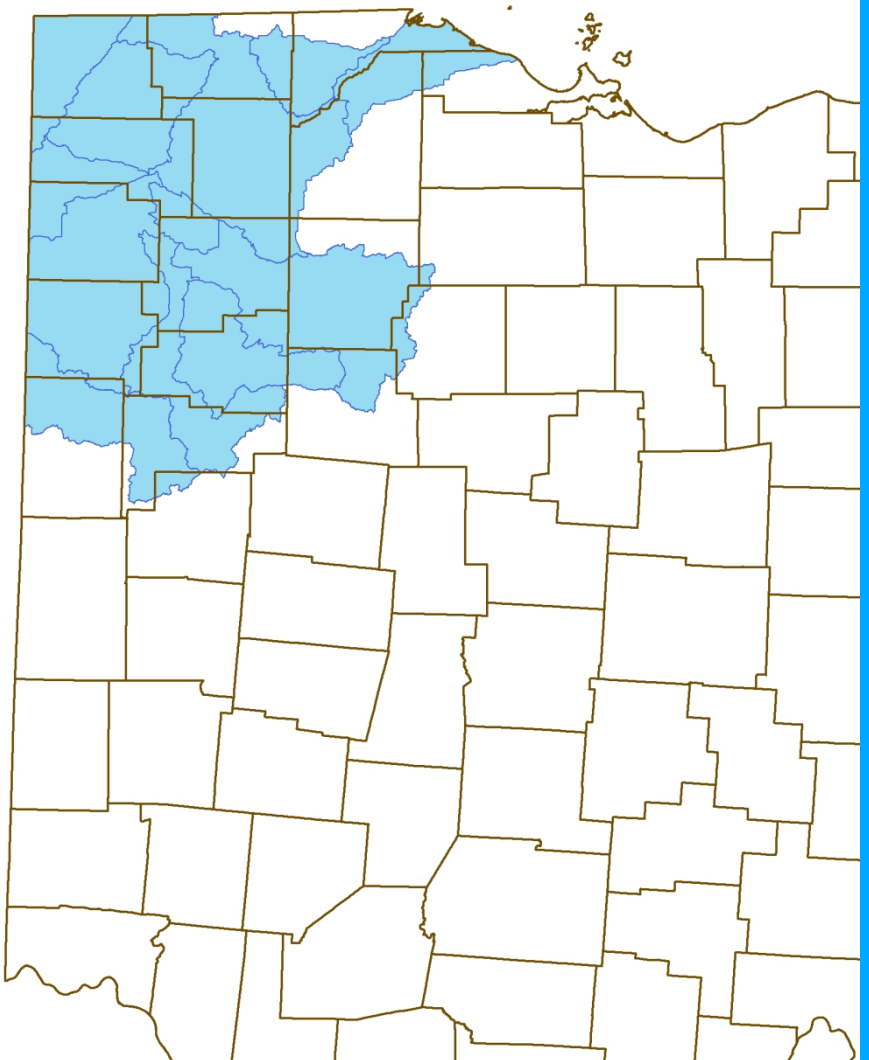
Mark Gazarek, Brian Robertson, & Timothy Bechtol:
Hancock County Commissioners

Lydia Mihalik: Mayor, City of Findlay

Township Trustees

Scott Peyton: Stantec Project Manager

Adam Hoff: Stantec Assistant Project Manager



Maumee Watershed Conservancy District

- Represents 15 Counties in Northwest Ohio
- Political subdivision of the State
- Oversees water management, including flood risk reduction
- Established under Ohio Revised Code Chapter 6101

Who is Stantec?

- Multi-Disciplinary Engineering Firm
  - Over 22,000 team members
  - Specialize Locally in Water & Geotechnical Engineering and Environmental Permitting
- Ohio Offices
  - Toledo, Columbus, Cincinnati and Cleveland
- Example Projects
  - Licking River Hydraulic Improvements
  - Scioto River Greenways
  - ODNR Dam Safety Projects
  - FEMA Countywide Floodplain Work
  - Toledo Waterways Initiative
  - Flood Diversion and Dam in Calgary
  - New Orleans Pump Stations
  - USACE Dam and Levee Projects

Stantec

Agenda

Project Overview

Stantec's Work

- Gap Analysis
- Project Refinements
- Project Alternatives
- Benefits & Impacts Summary
- Opinions of Probable Cost
- Stantec's Recommendation

Path Forward

Questions

Stantec

Blanchard St. Bridge

Project Overview

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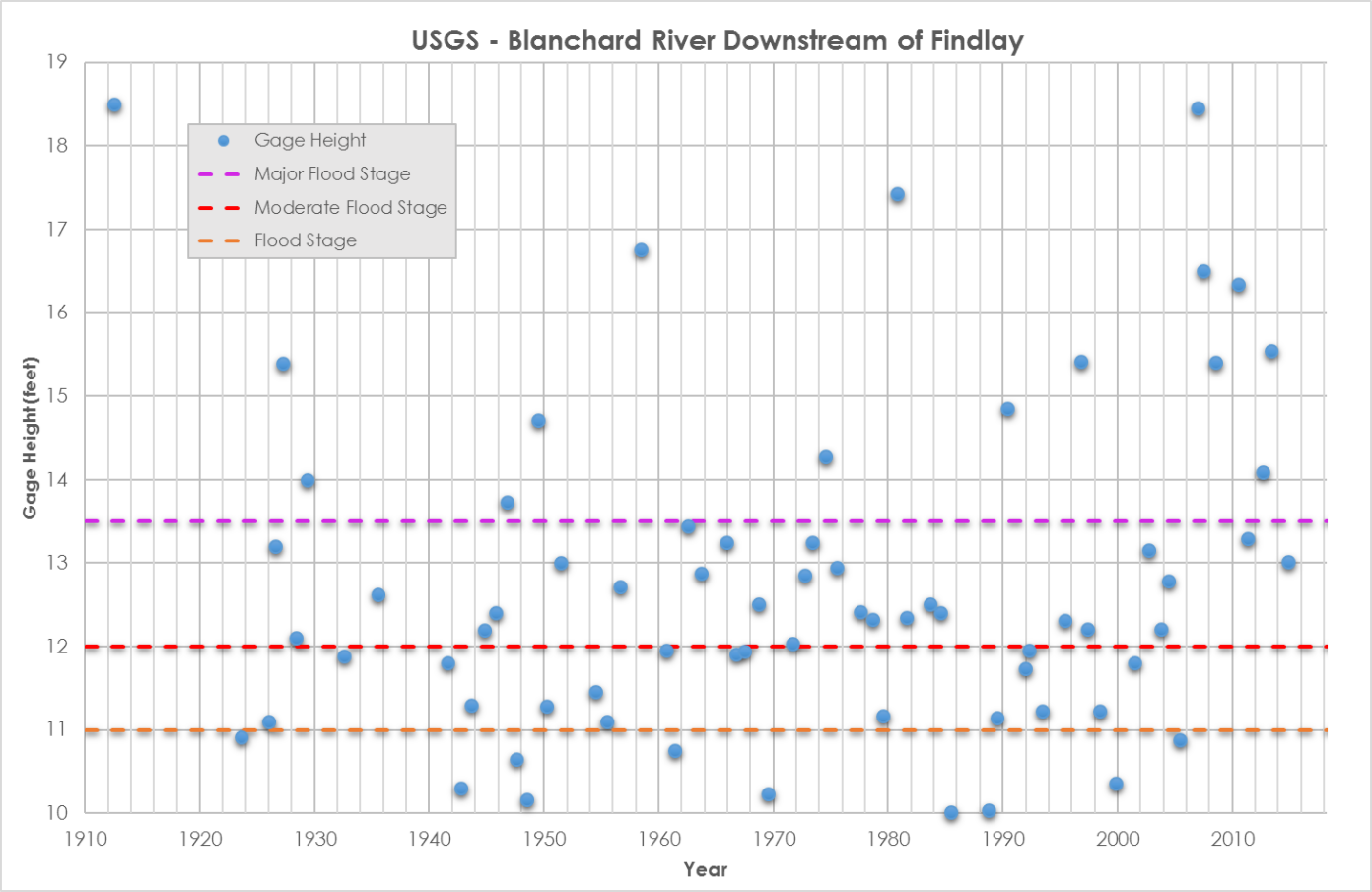
Our Challenge

Larger floods have occurred more frequently



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August 2015 Recommended Plan
USACE Buffalo District
Legend
Bridge Crossing
Low Road Crossing
Preliminary Western Diversion Channel Alignment
Potential Channel Location Corridor
Diversion Channel Inlet
Rivers and Streams
Roads
Stream Mitigation Areas
Wetland Mitigation Areas
100 Year Flood Plain with August 2015 Recommended Plan
Bridge Added
Blanchard River
Aurand Run
Blanchard River
Lye Creek
Findlay Reservoir
Diversion Channel Realigned
Eagle Creek
Blanchard River
Levee Removed
Low Road Crossing Added

Western Diversion of Eagle Creek

USACE Opinion of Probable Cost

Eagle Creek Flows:

25-year 3,000 cfs

50-year 3,500 cfs

100-year 4,050 cfs

500-year 5,400 cfs

25-Year Channel Sizing Estimates		
01	Lands & Damages	$ 6,580,000
02	Relocations	$ 14,590,000
06	Fish & Wildlife	$ 1,758,000
08	Roads, Railroads Bridges	$ 2,657,000
09	Channels and Canals	$ 34,587,000
15	Floodway Control & Diversion Structure	$ 8,708,000
18	Cultural Resource Preservation	$ 692,000
30	Planning, Engineering & Design	$ 8,182,000
31	Construction Management	$ 3,149,000
	First Costs	$ 80,903,000
	Interest during construction	$ 5,671,000
	Total Cost	**$ 86,574,000**

About $20 million allocated for new bridges and roads

Includes 27.5% Contingency

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Enter Stantec

Preliminary Scope

Complete

- Analyze the USACE Feasibility Report to understand their findings and recommend changes to the Corps' Plan
- Perform surveys and geotechnical explorations
- Determine preferred channel alignment

Not yet Authorized

- *Prepare property acquisition plan and legal descriptions*
- *Prepare final design and construction plans*
- *Prepare necessary documents to secure regulatory permits*

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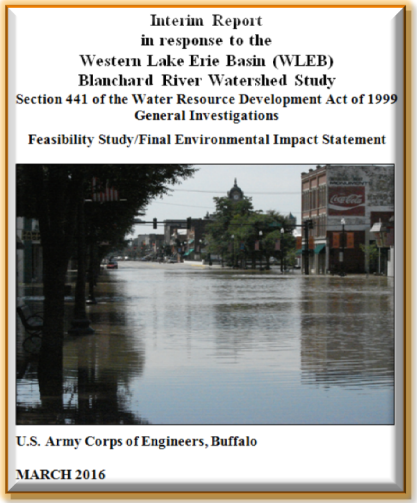
Gap Analysis

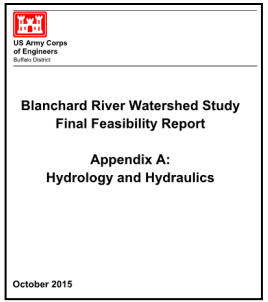
Data Reviewed

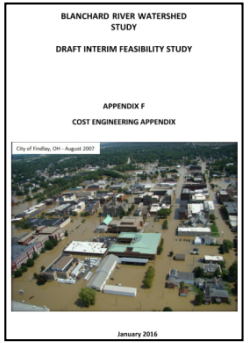
- Reports
- Digital Files:
  USACE
- Public Data:
  USGS, ODOT, others

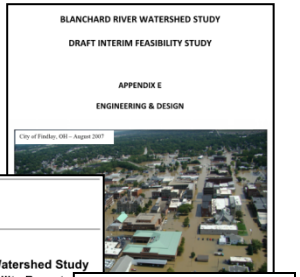
Project Components

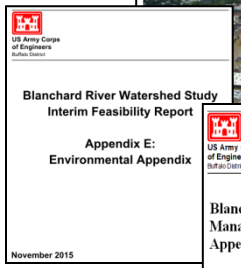
- **Hydrology & Hydraulics**
- Geotechnical
- Transportation
- **Cost**
- **Economics**
- Design
- Environmental

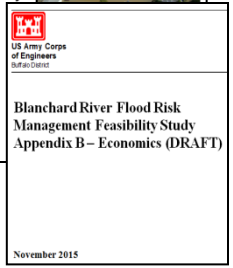


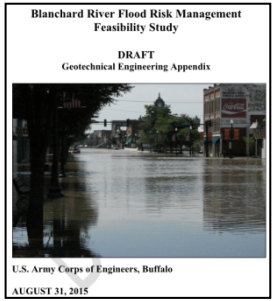












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4 Key Gaps

Design and Engineering

Federally driven project objective

Cost and Economics

BCR less than 1.0

Hydrology & Hydraulics (H&H)

Risk based evaluation needed

Conflicting results between USACE model and report

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Revised Project Objective

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)

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Additional Data Collection And Analysis

Costs and Economics (BCR)

- Additional (non-federal) benefits include:
  - Road closures
  - Business losses
  - Lost income/wages
  - Temporary relocation/reoccupation costs
  - Agricultural benefits and losses
  - Others
    - Utility damages, debris removal costs, location benefits, intensification benefits, employment benefits.

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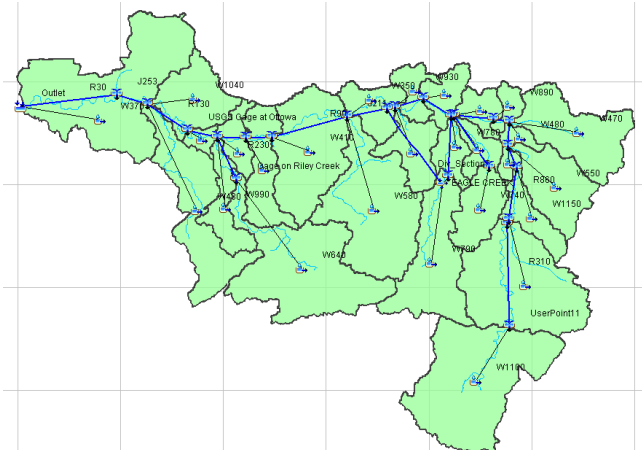
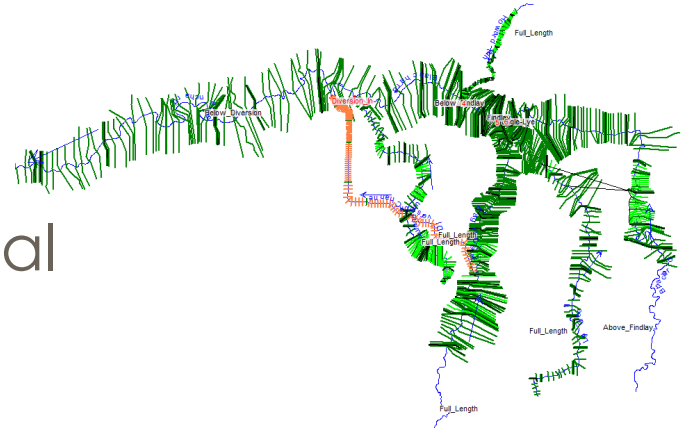
Economics
Public Policy
Planning
Jack Faucett Associates
Since 1963

Additional Data Collection And Analysis

Hydrology & Hydraulics

- 15 Alternatives
- Hydrologic & Hydraulic Models
- Methodology & Model Results





- Reviewed Historical Storms and Additional Hypothetical Events

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Concept
Design Analysis

Diversion Channel Refinement

Size

Alignment

Profile

Inlet Location

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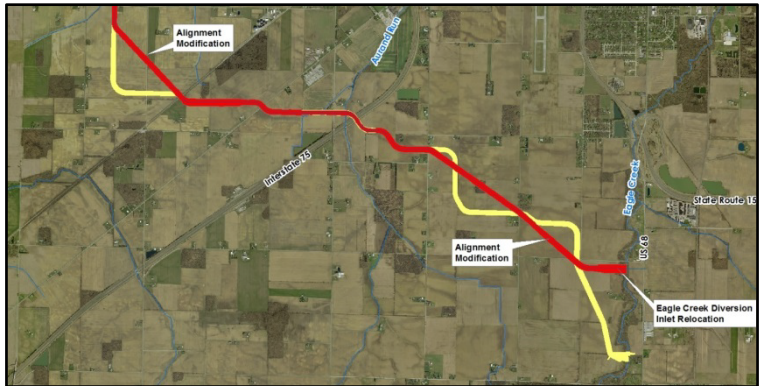
Concept Design Refinement

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



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Why Alternatives?

Remaining Problems to Solve

Conflicting Model/Reporting Results

Residual Risk of Project

Double-Peaked Hydrograph

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Conflicting Results

April 2015

August 2015

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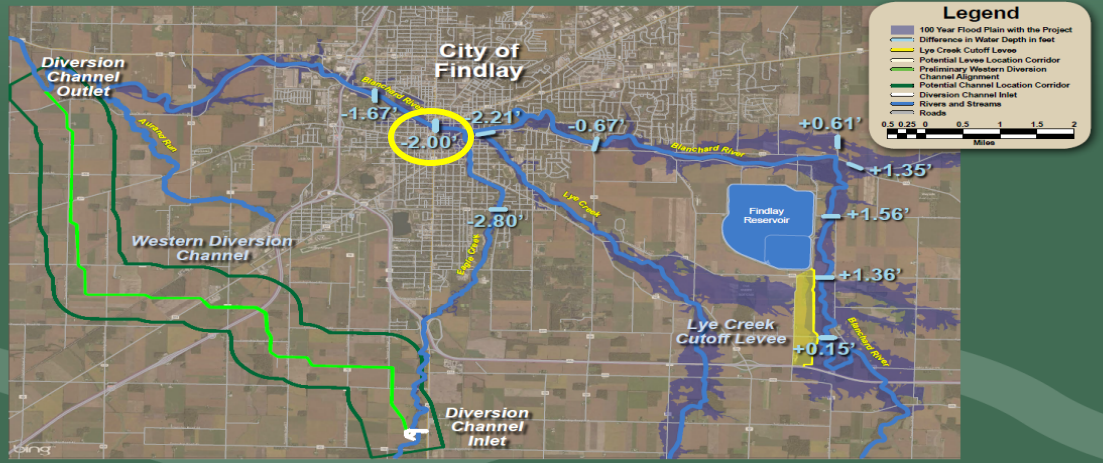
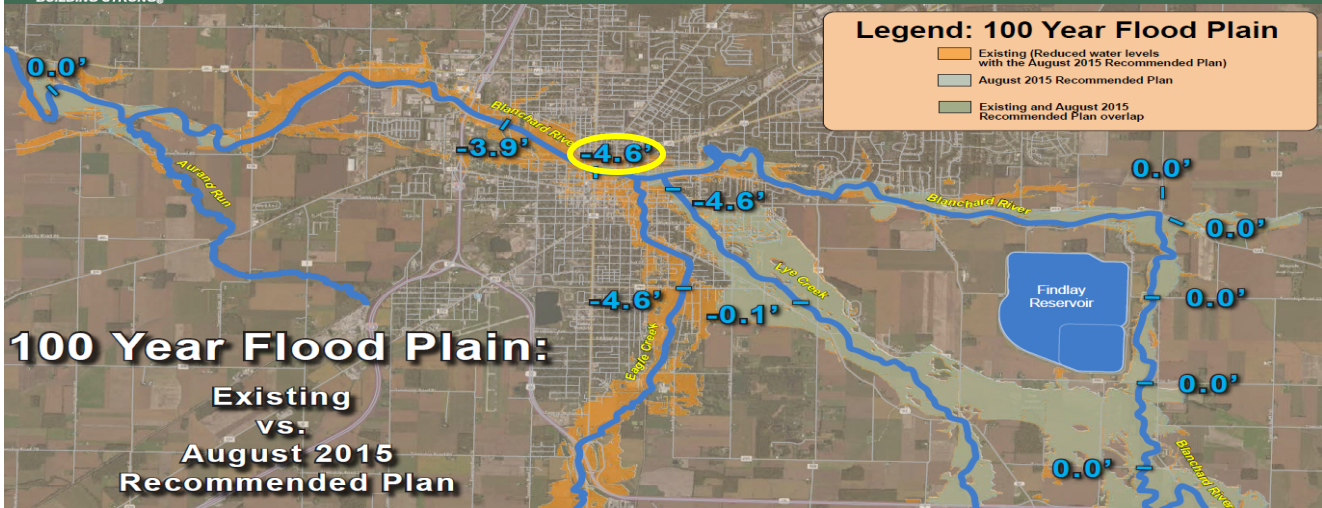
100 Year Storm Event with Proposed Project



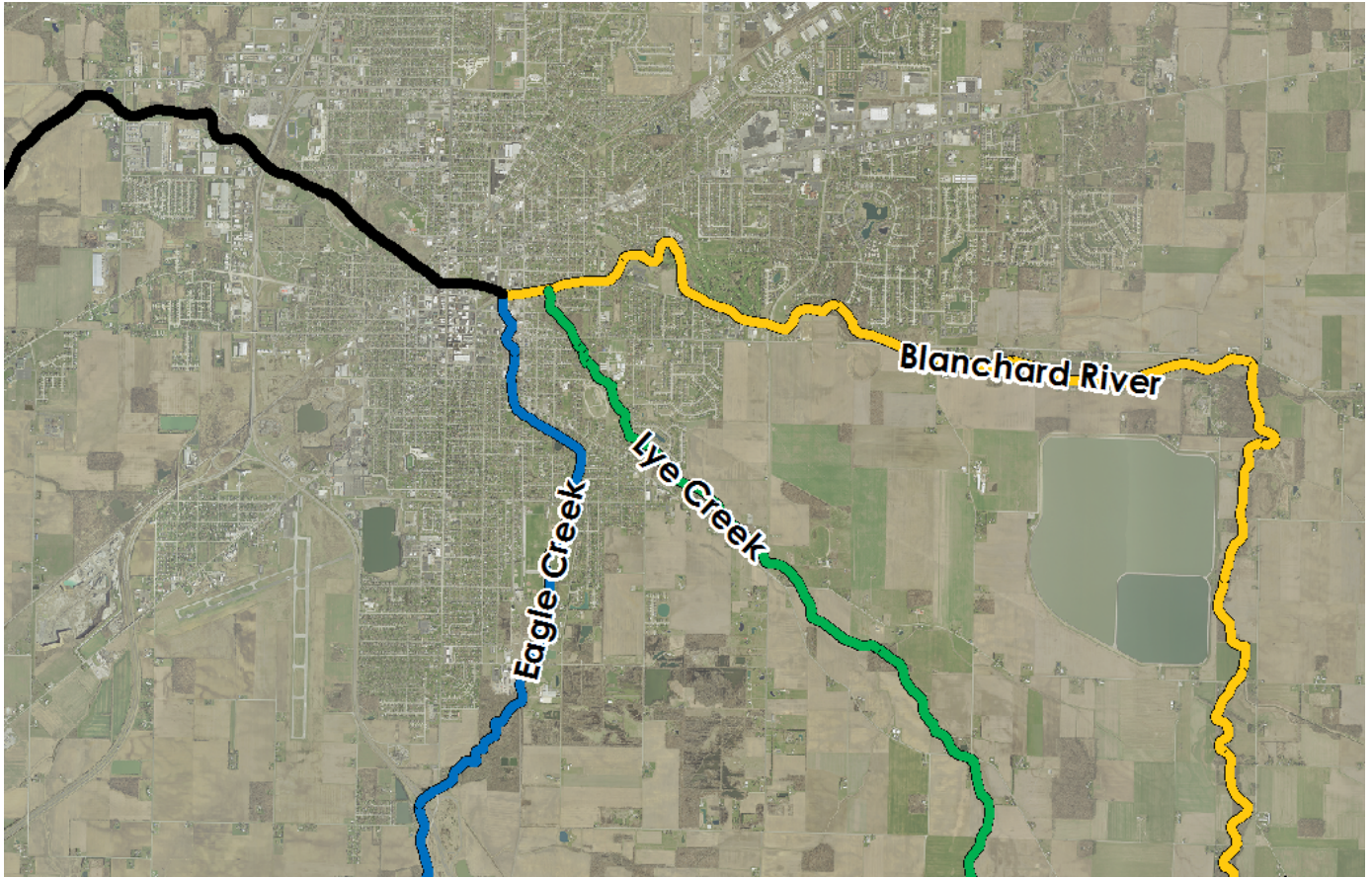
US Army Corps of Engineers
Buffalo District
BUILDING STRONG

The 100 year flood plain is based on the results of the U.S. Army Corps of Engineers (USACE) hydrology and hydraulics model. USACE will coordinate with the Federal Emergency Management Agency (FEMA) and submit the necessary documentation for map revisions for modifications to existing flood insurance maps.



Where does the water come from?

Blanchard River – Eagle Creek – Lye Creek



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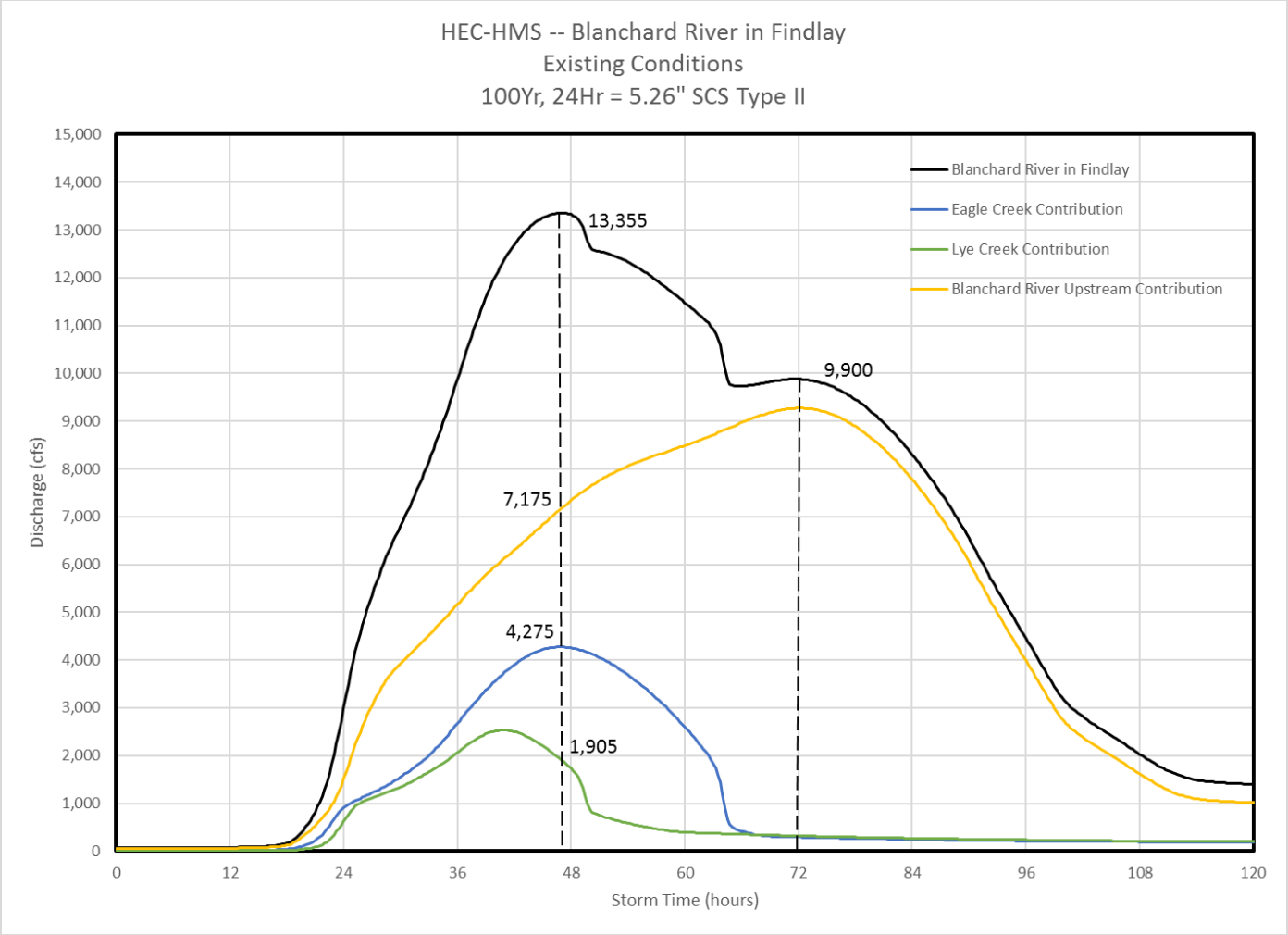
1% ACE

USACE HEC-HMS

- Existing Conditions



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1% ACE

USACE HEC-HMS
- Existing Conditions
- USACE Plan (Expected)

USACE HEC-RAS
- USACE Plan (Modeled)

"The 4.6' drop in WSE in downtown Findlay is based on a model run where the flow optimization feature did not properly converge on an internally consistent result." - USACE

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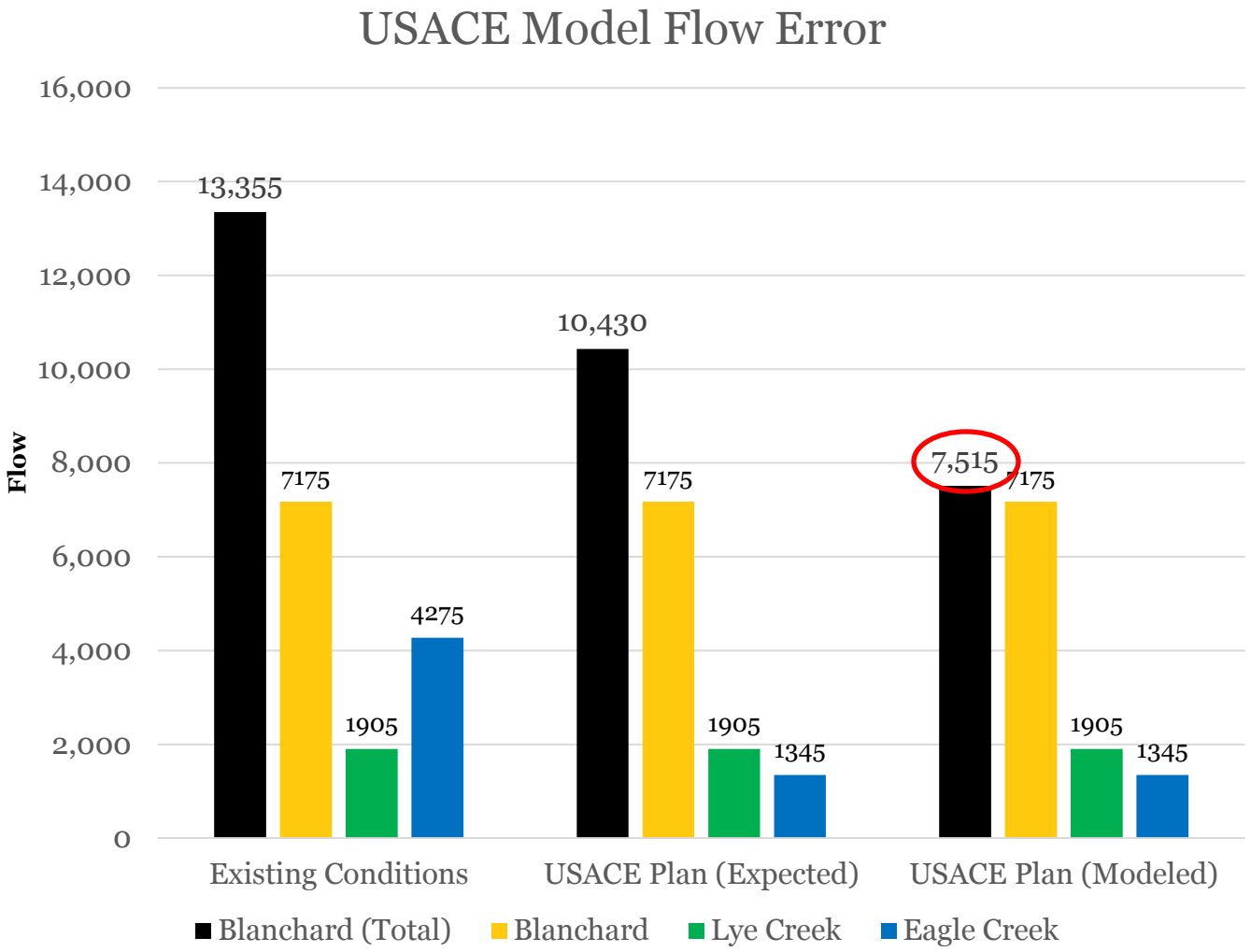
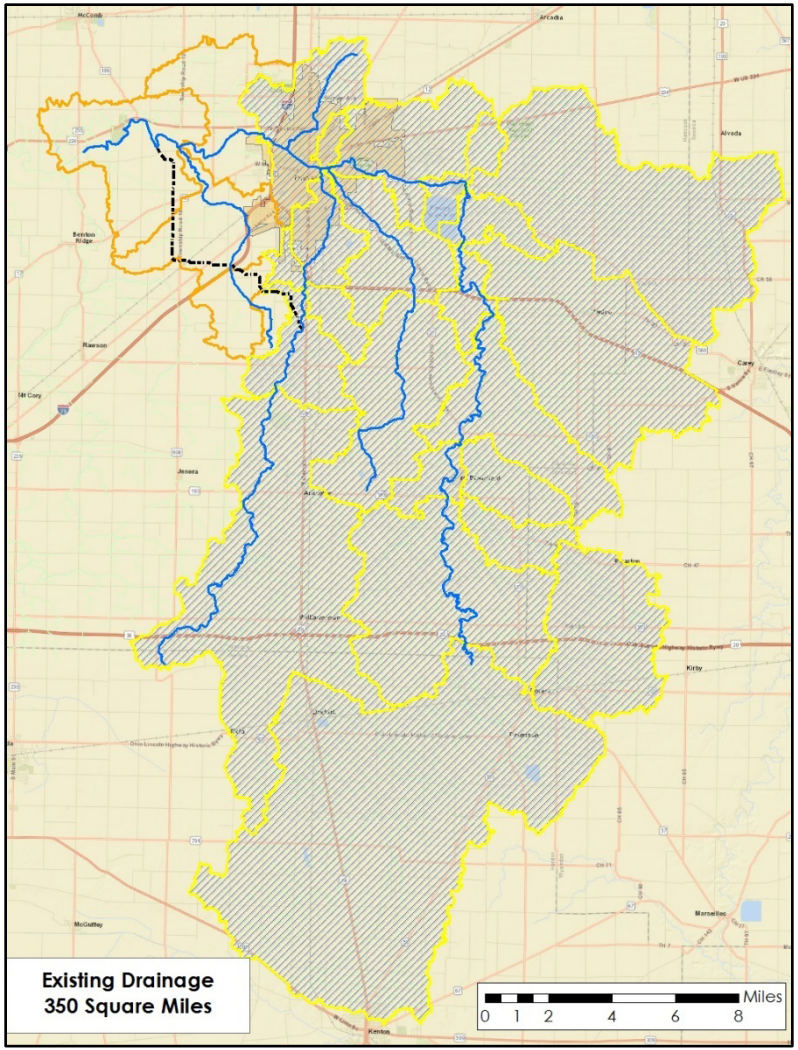


Residual Risk

The Blanchard River Watershed



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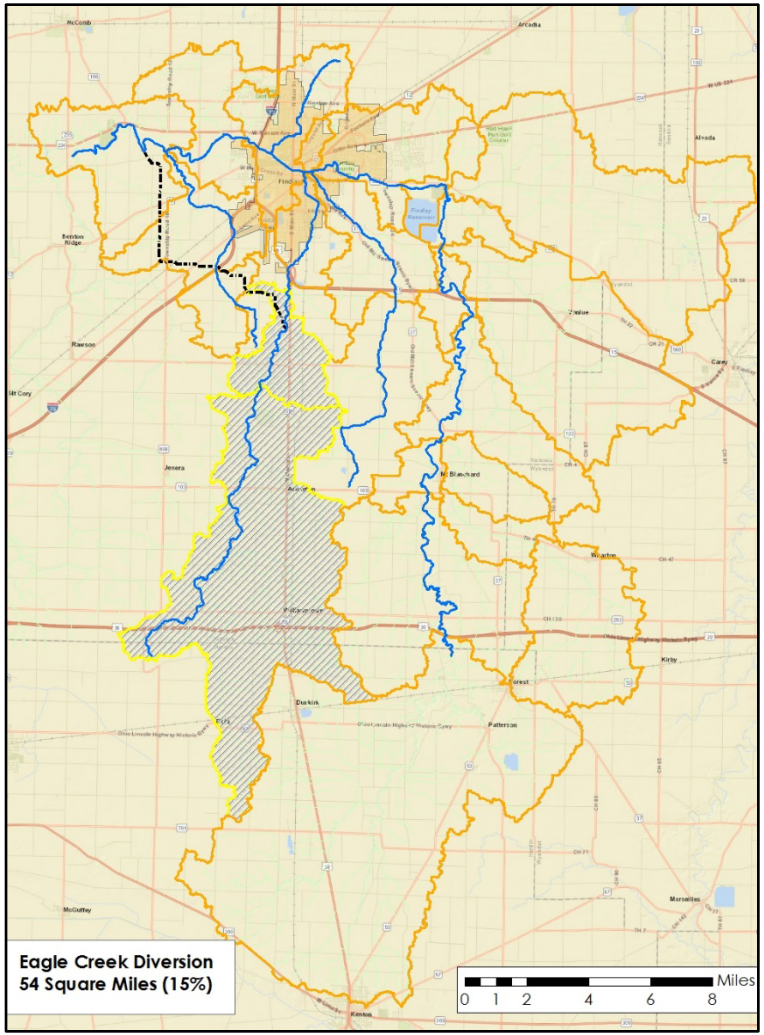
Residual Risk

15% of Watershed Influenced



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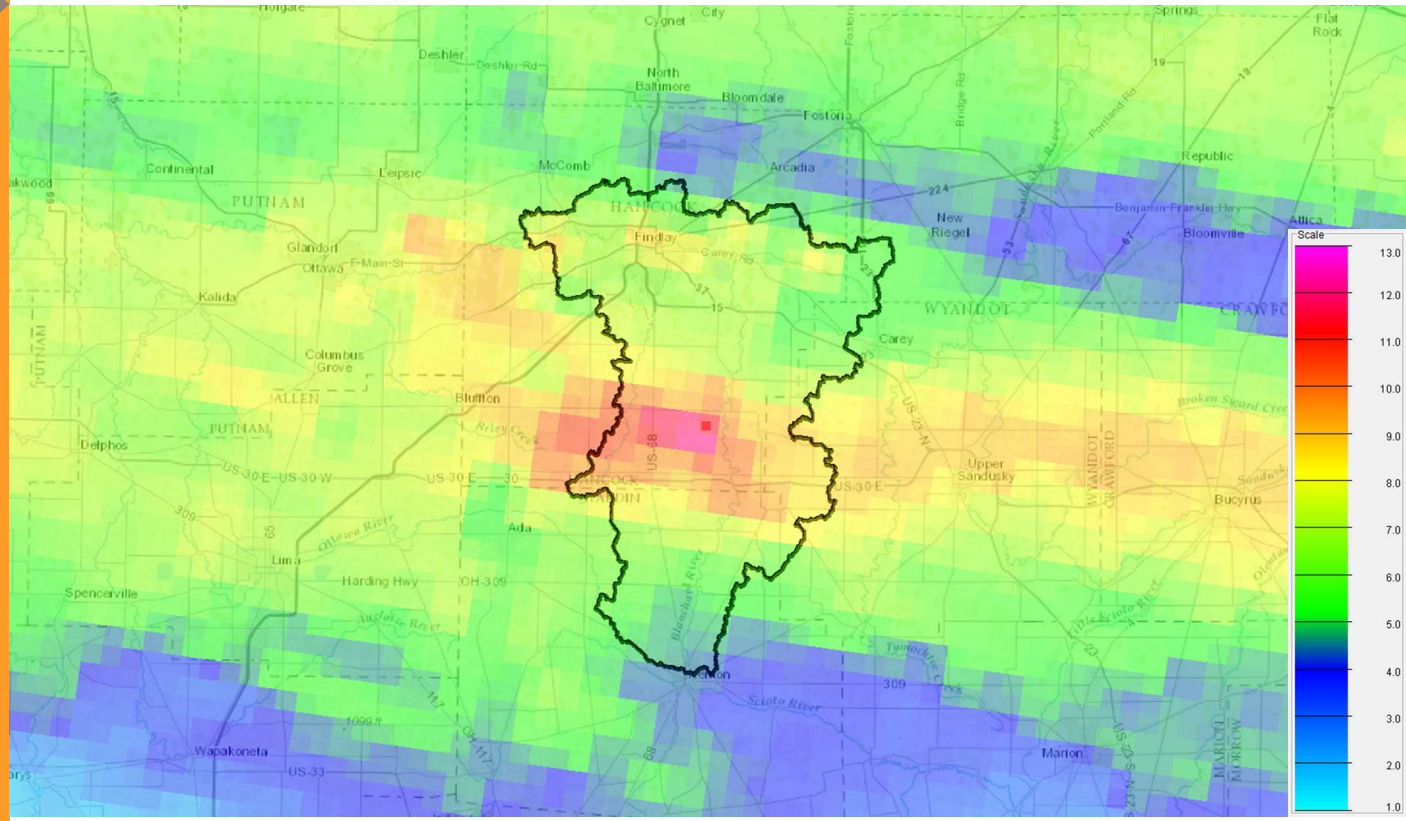
Residual Risk

2007 Storm



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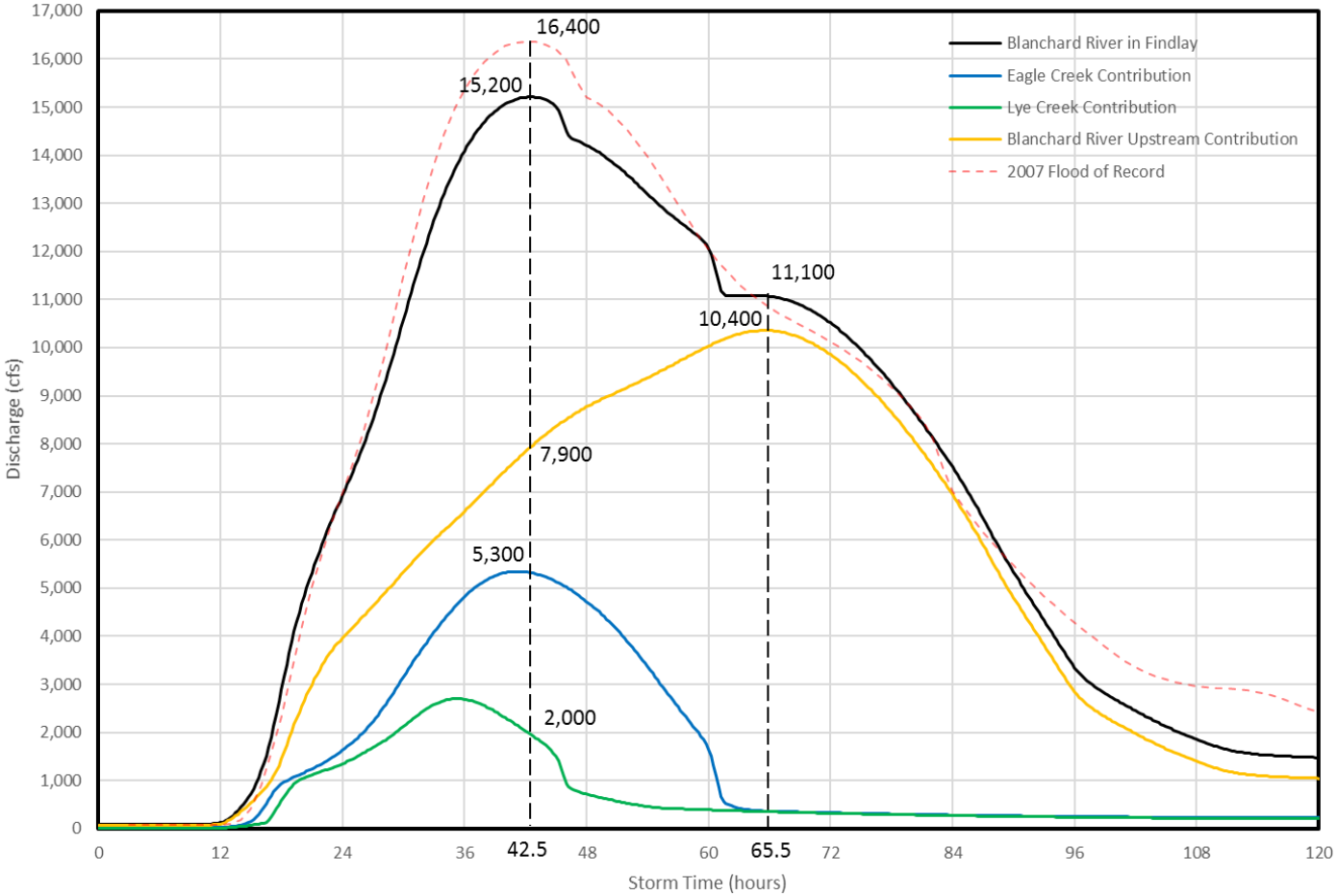
Double Peak



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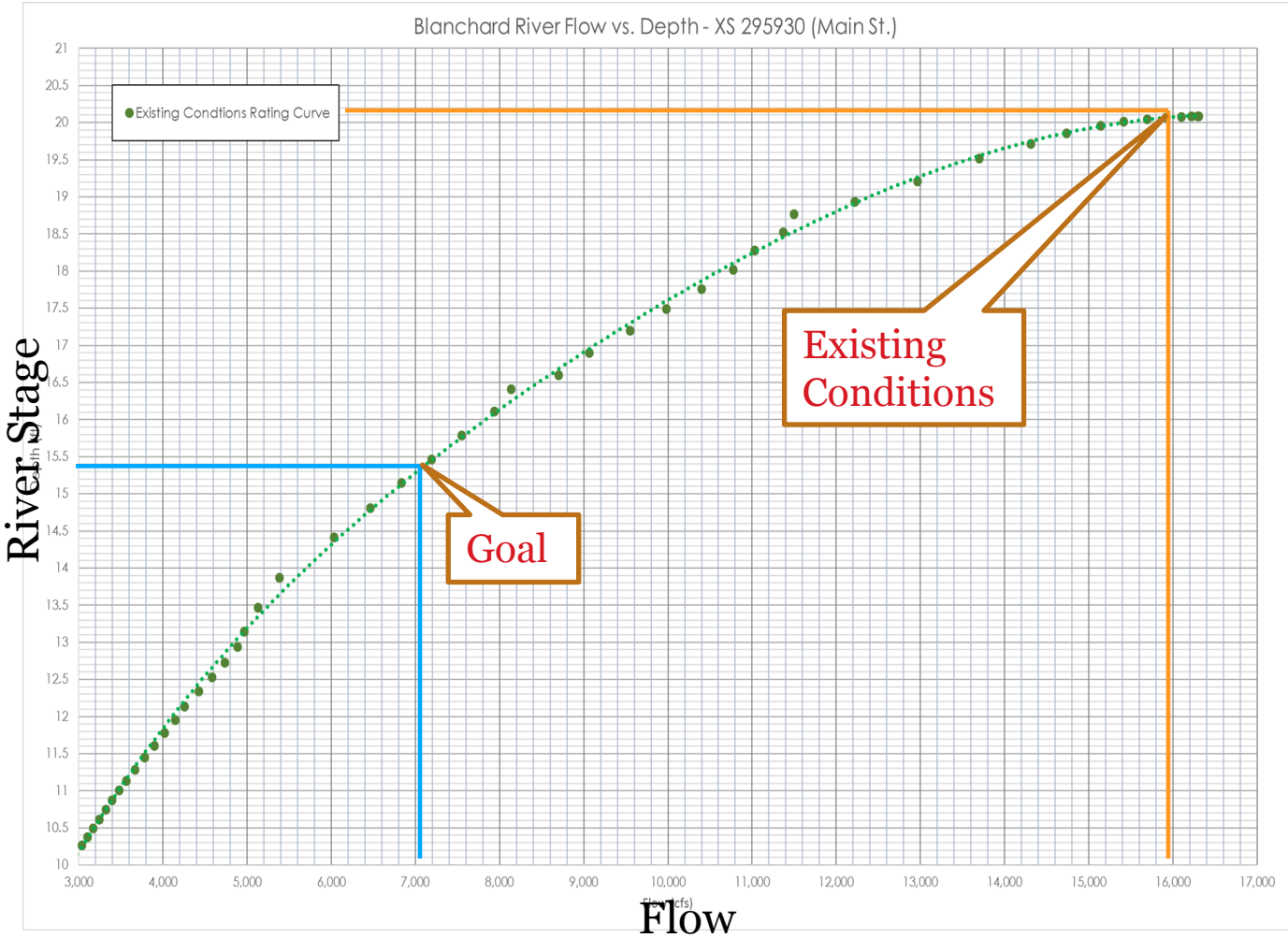
Blanchard River Rating Curve at Main Street



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Alternatives

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Concept Designs Reviewed

Hydraulic Improvements

Remove Inline Riffles/Dams

Floodplain Bench Widening

Bridge Modifications

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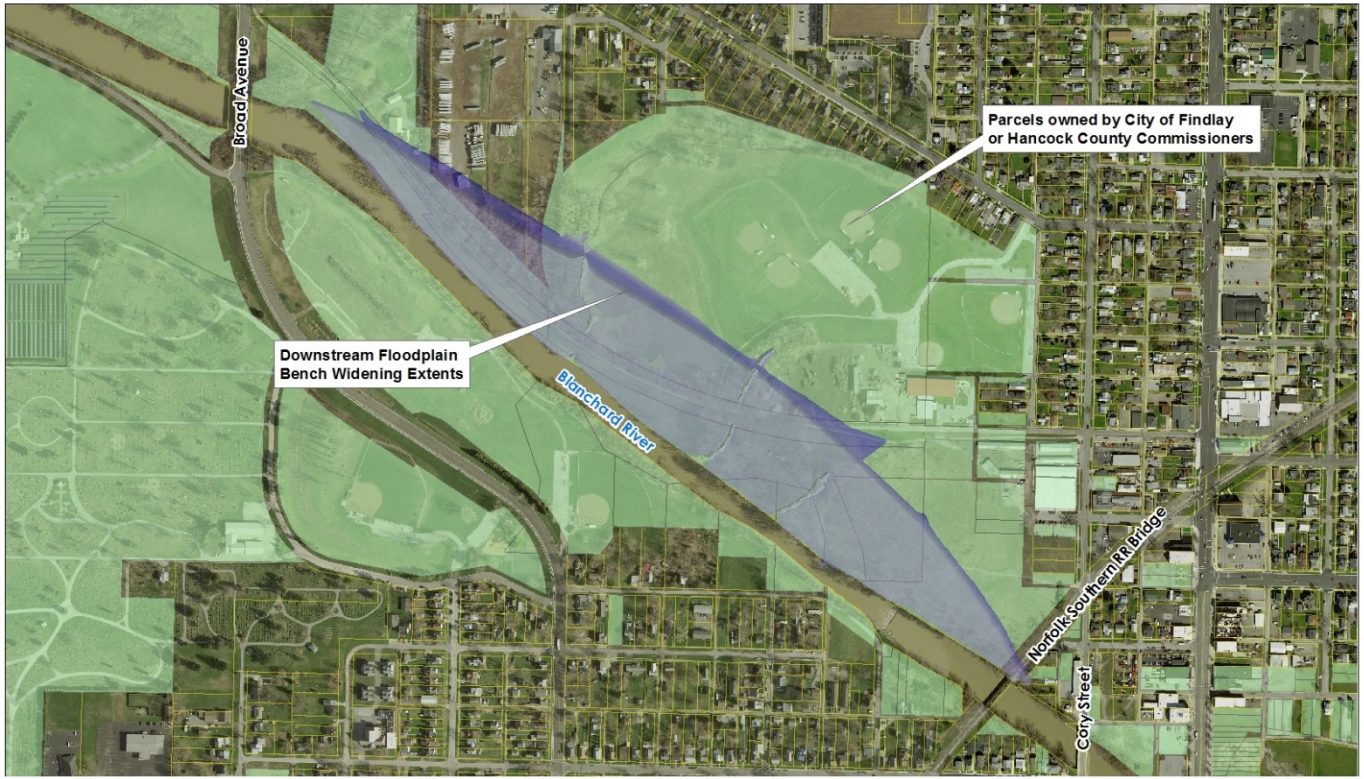
Hydraulic Improvements

Floodplain Bench Widening



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Hydraulic Improvements

Low Head Dams & Riffle Structures

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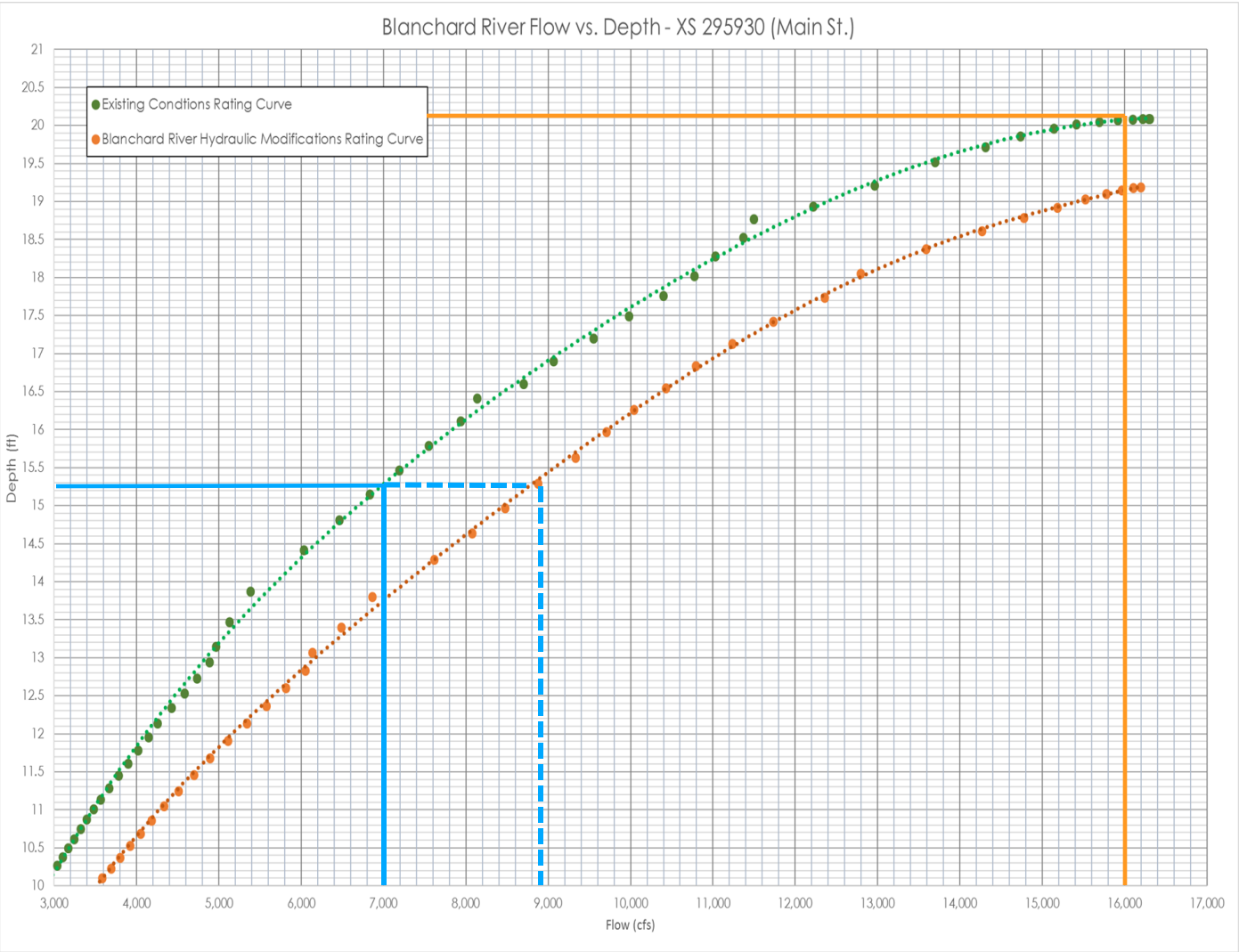
Liberty St
Apple Alley
Blanchard River
Washington St
S West St
Washington St
Washington St
Meeks Ct
N Cory St
N Cory St

New Blanchard River Rating Curve at Main Street



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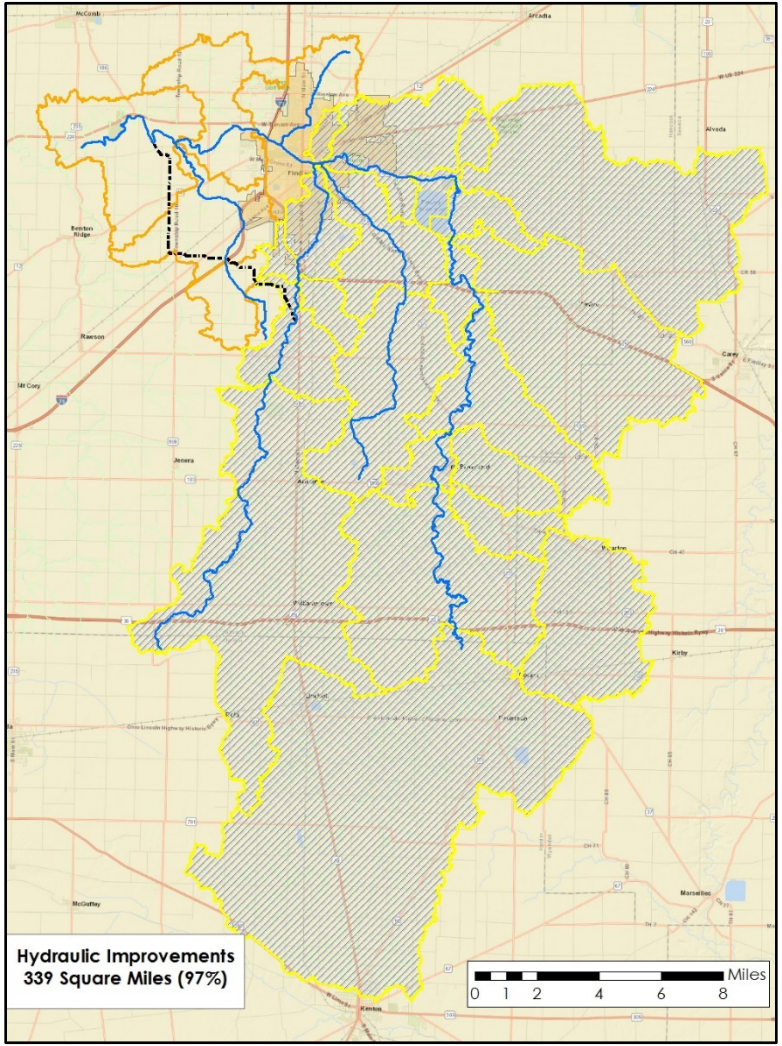
Percent of Watershed Influenced



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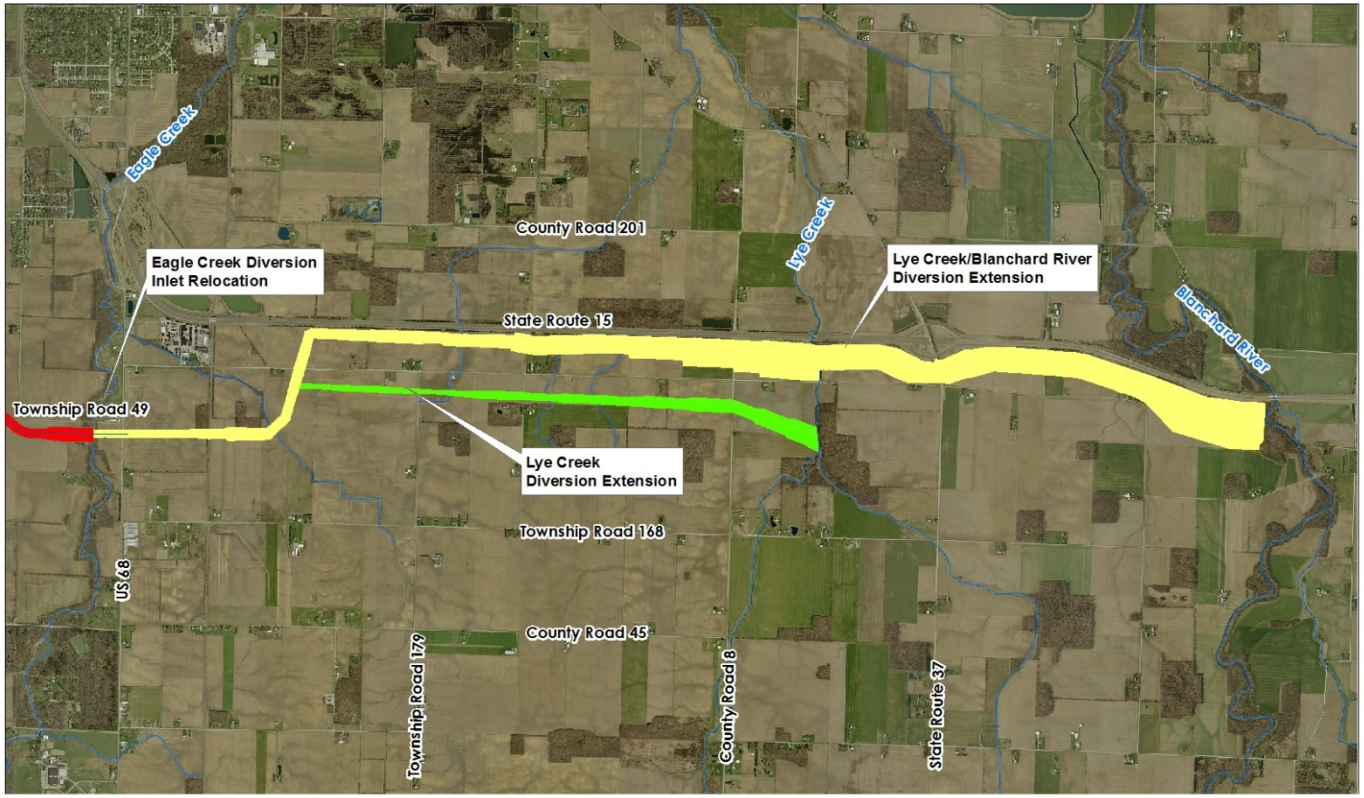
Diversion Extension

Eagle to Lye to Blanchard

Up to 1,200 ft wide

Between 2 and 7 ft deep

14 New Bridges and 5 Cul-de-sacs



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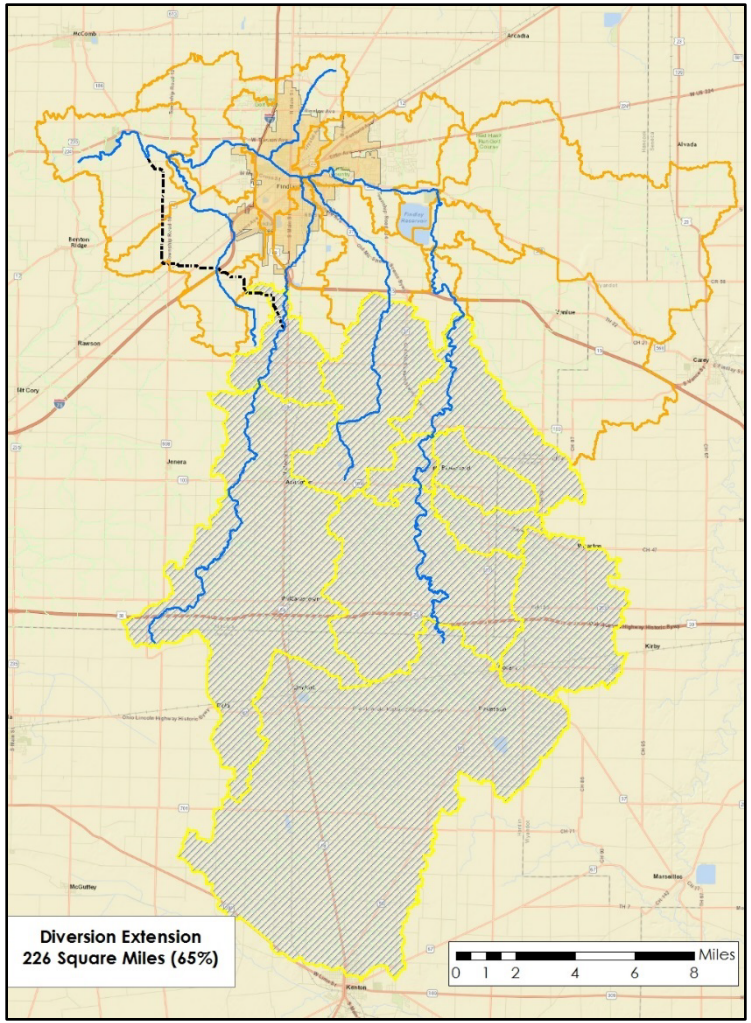
Percent of Watershed Influenced



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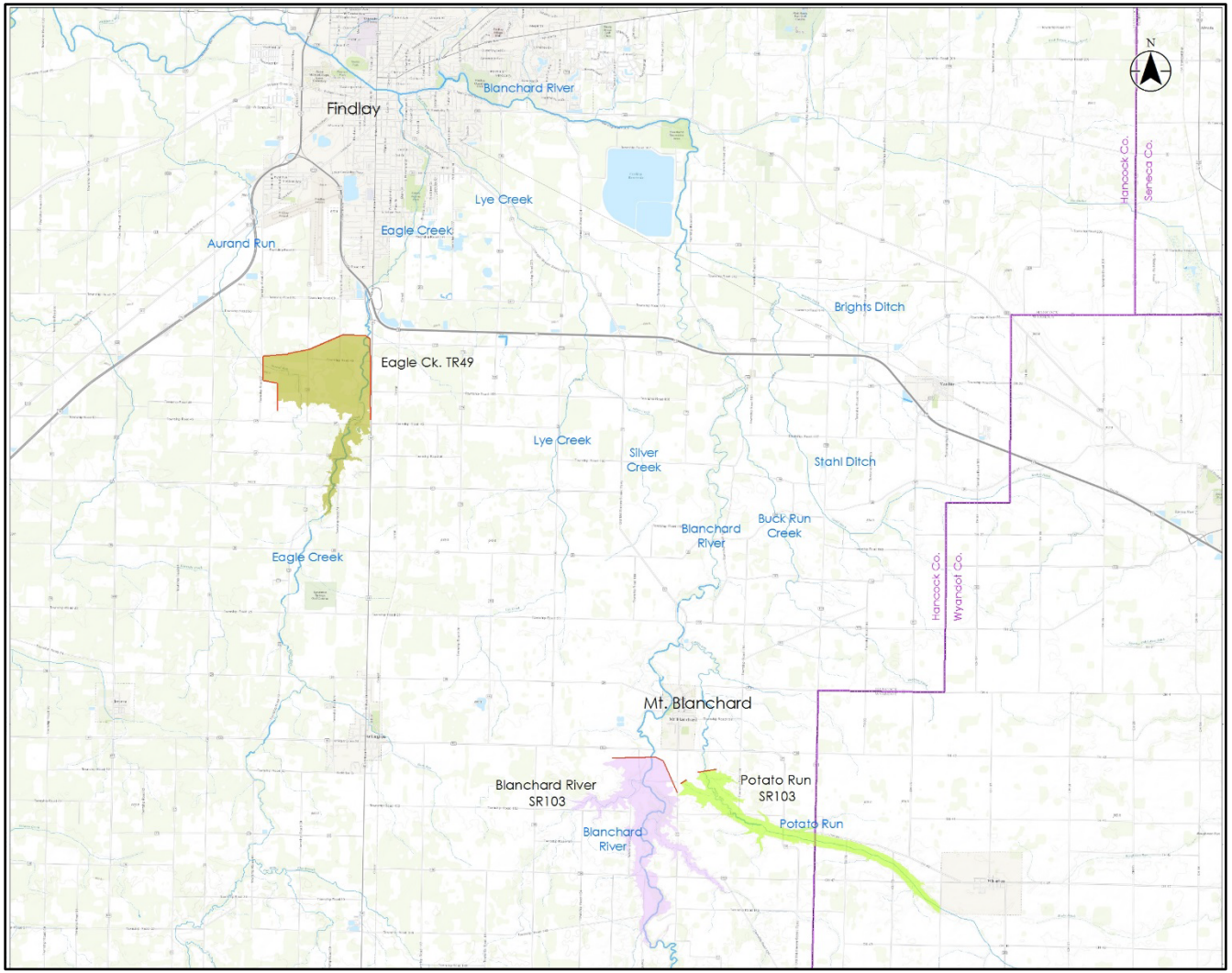
Storage



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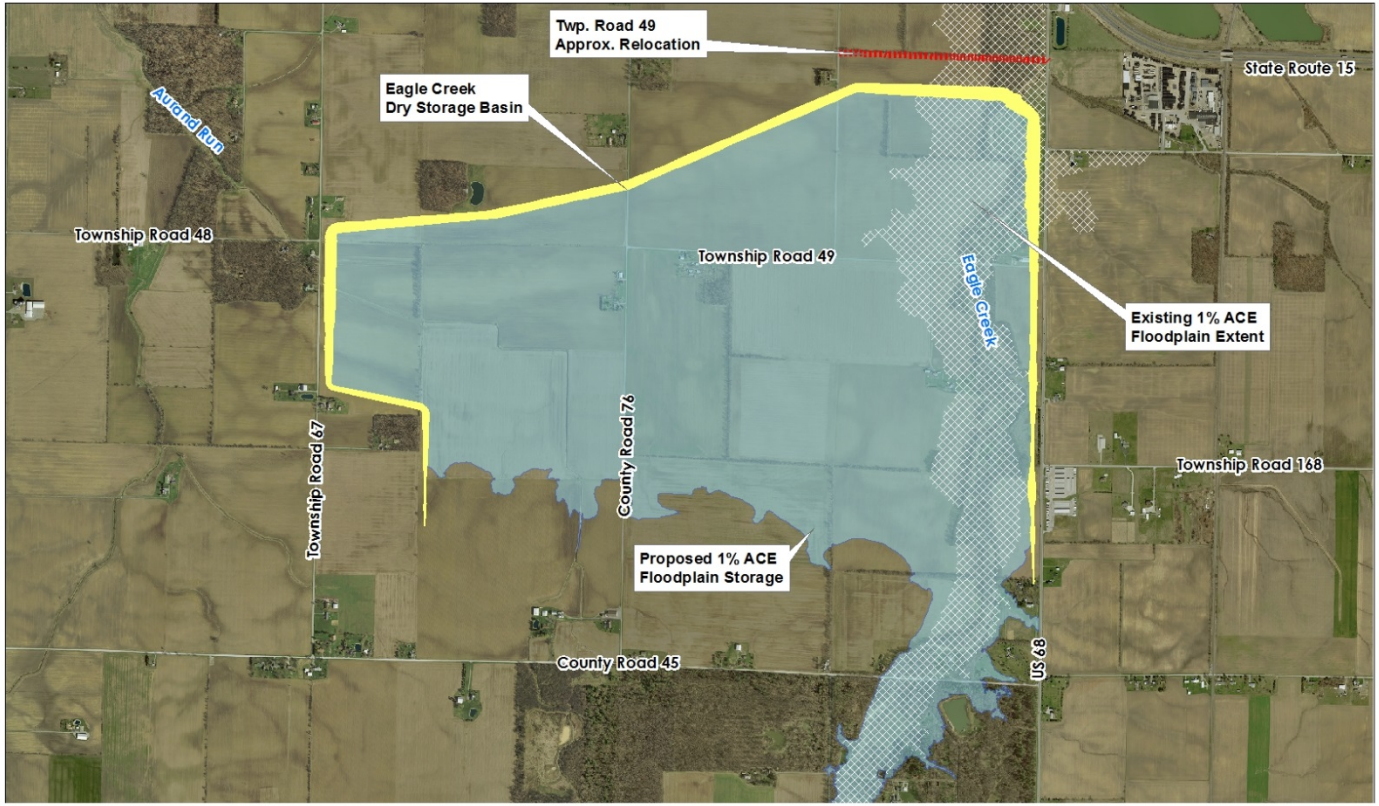
Storage

Eagle Creek Dry Storage



N

0 500 1,000 2,000 3,000 4,000 Feet

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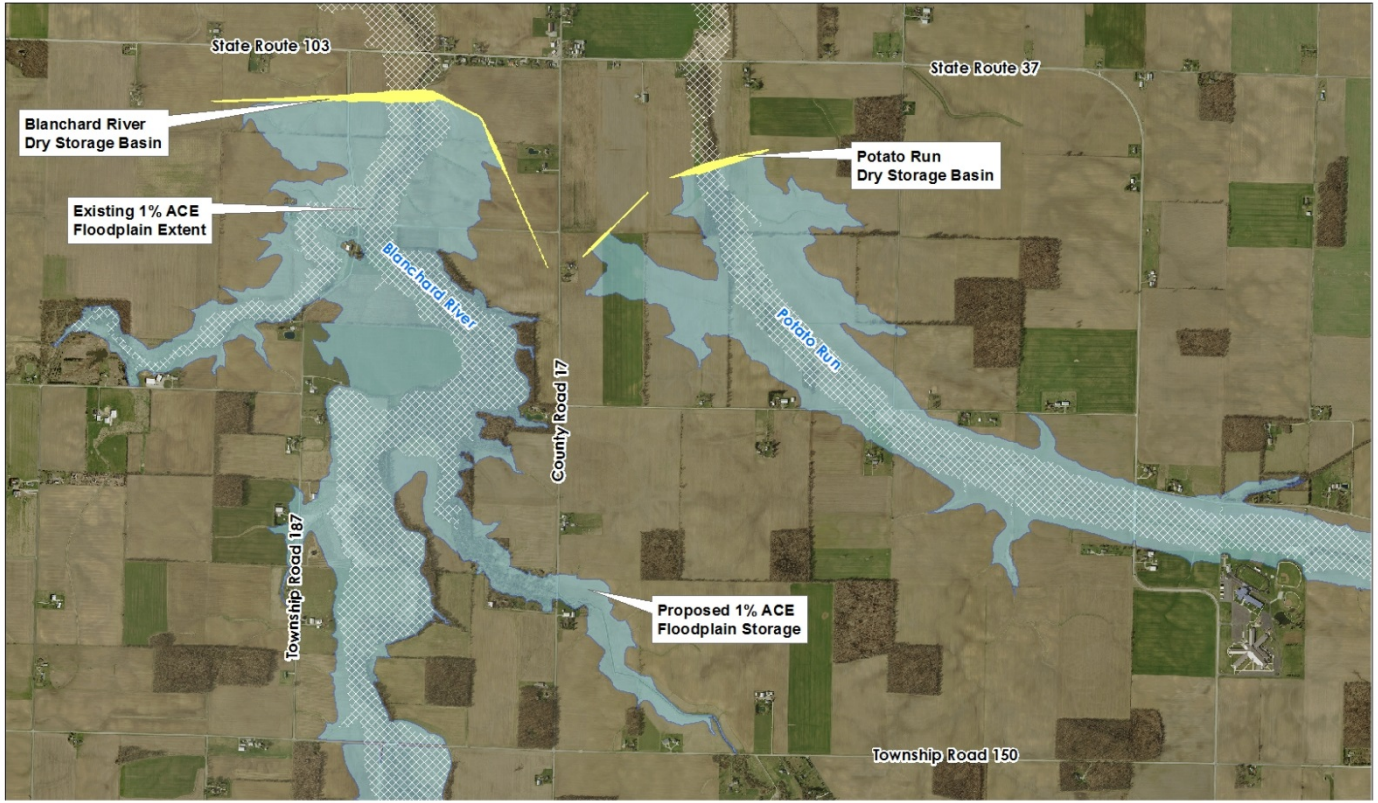
Storage

Blanchard River & Potato Run at Mt. Blanchard



N

0 500 1,000 2,000 3,000 4,000 Feet

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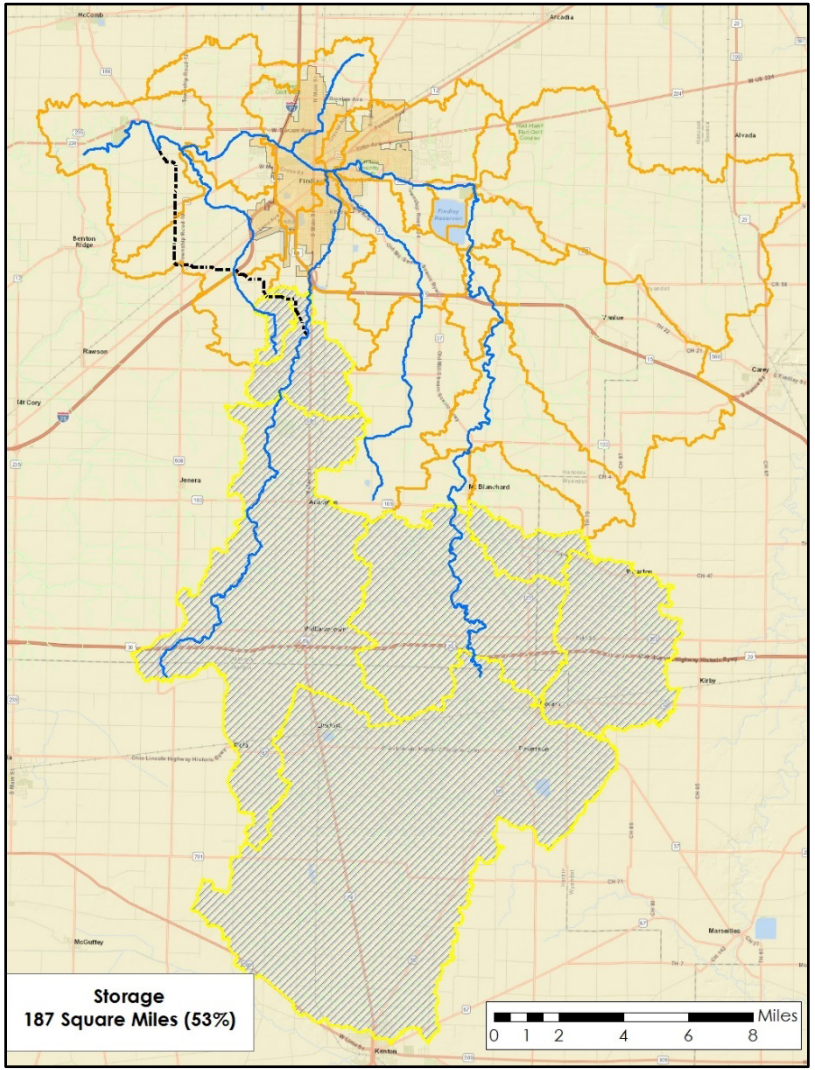
Percent of Watershed Influenced



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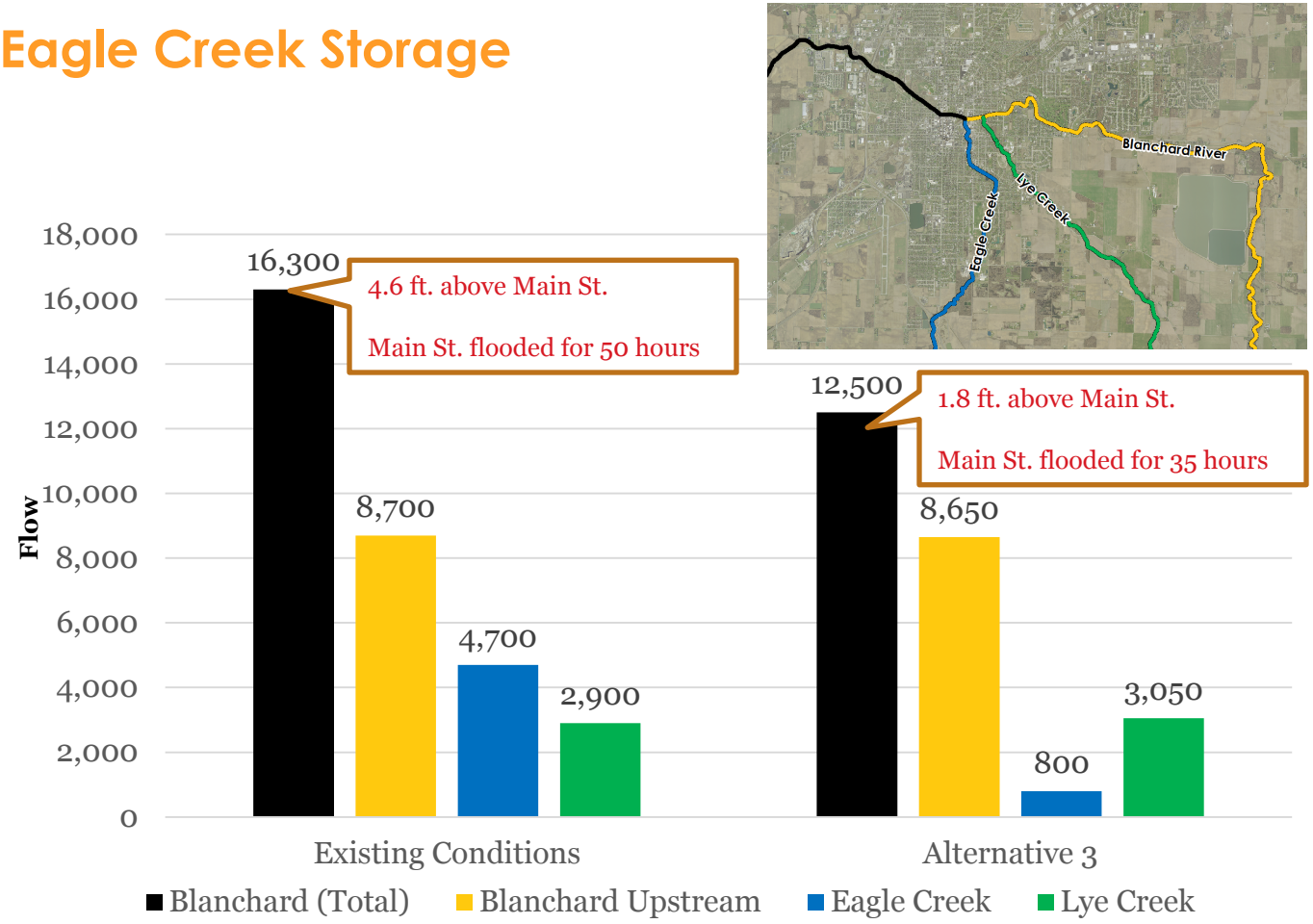
Eagle Creek Storage

1% ACE
100-Year, 24-Hour
SCS Type II = 5.26"

Blanchard River in Findlay



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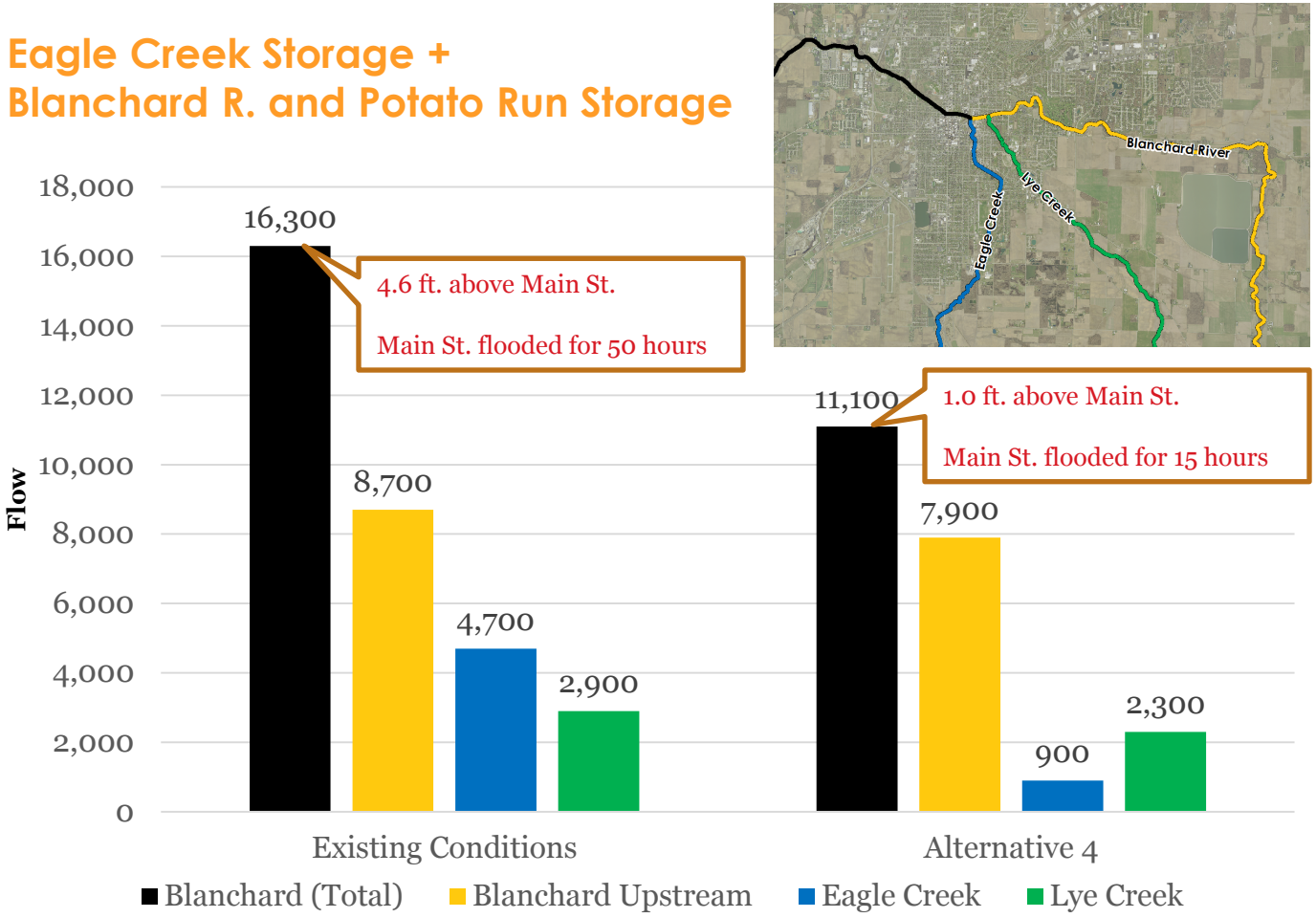
Eagle Creek Storage + Blanchard R. and Potato Run Storage

1% ACE
100-Year, 24-Hour
SCS Type II = 5.26"

Blanchard River in Findlay



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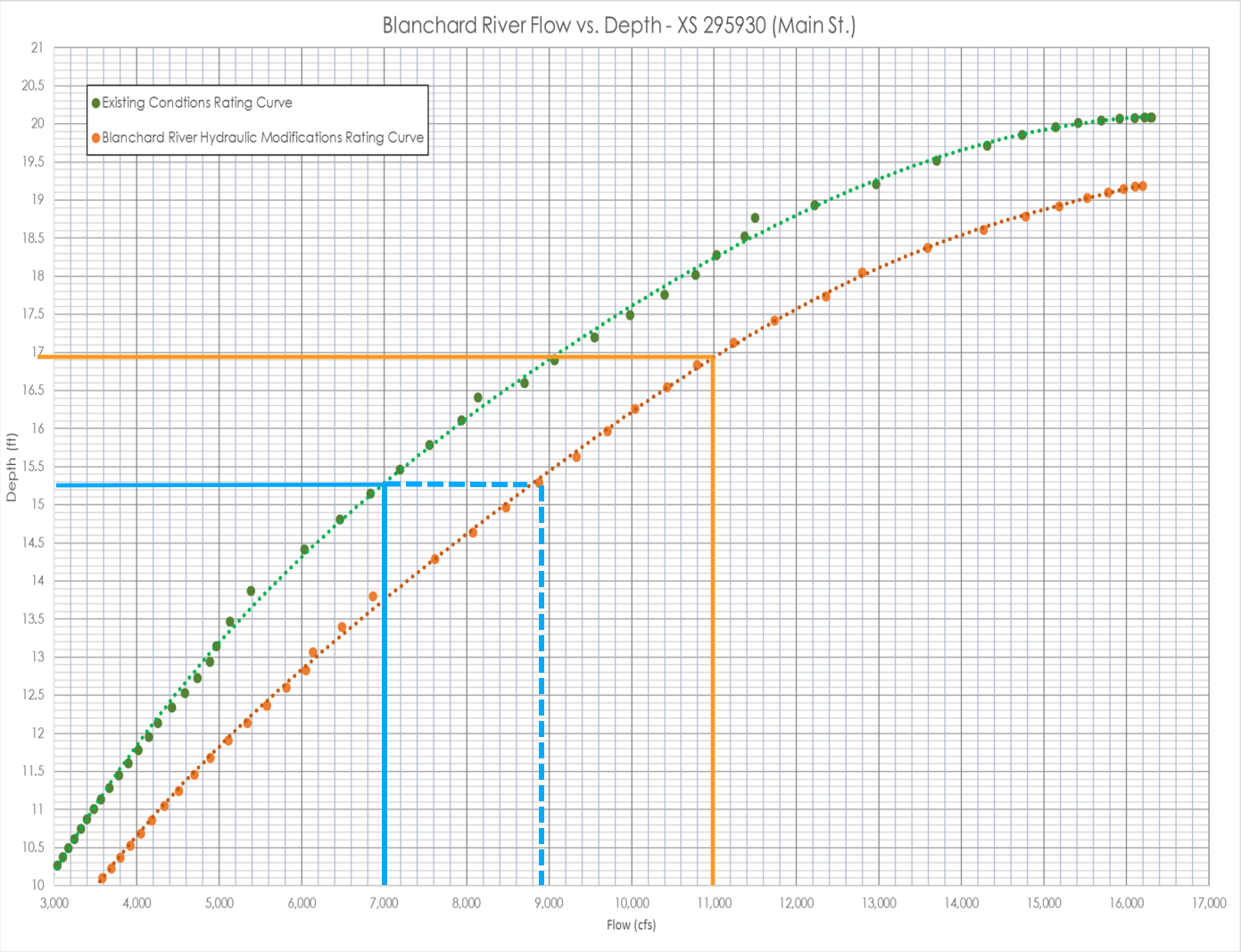
New Blanchard River Rating Curve at Main Street



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Opinions of Probable Cost

Alternative Components

Alternative Option	Base Cost	Cost With Contingency
USACE Plan (25-Year Diversion of Eagle Creek)	**$63,804,000**	**$80,902,000**
Refined Diversion (100-Year Diversion of Eagle Creek)	$81,300,000	$105,690,000
Diversion Channel Extension (Eagle Creek to Blanchard River)	$67,800,000	$88,140,000
Total Diversion Channel Extension	**$149,100,000**	**$193,830,000**
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**

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Opinions of Probable Cost

Spatial Spread of Projects

Independent Projects that make up a Program

Alternatives

Alternative	Base Cost	Cost With Contingency
Alternative 0 – 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

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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	--	--	--	--	--	--	--	--
1	USACE Plan (25-Year Diversion)	0.9	3.6	45	960	1	13	960	1,690	1,140	75	1,670
2	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)

1% ACE Flood

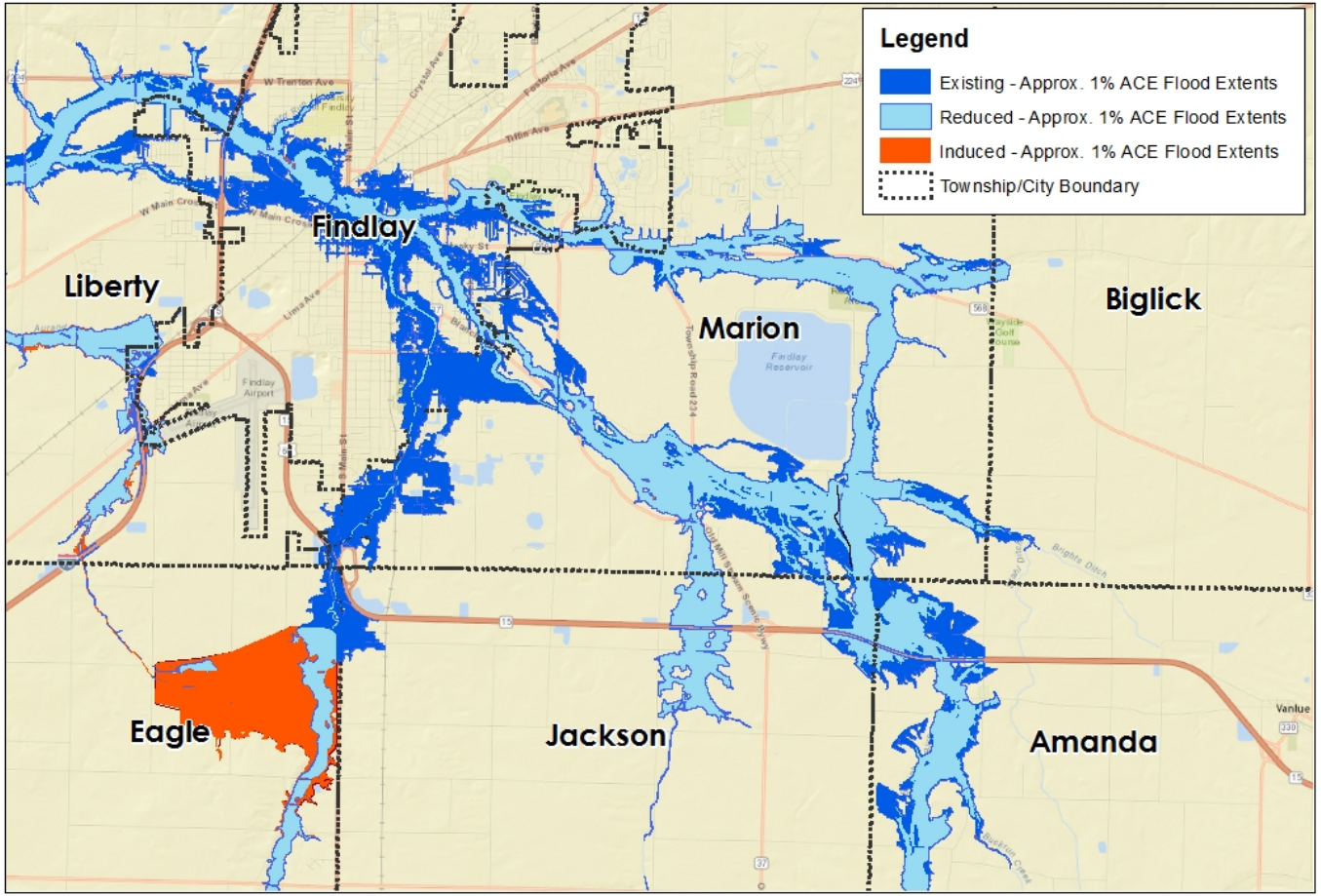
Blanchard & Potato Storage

+

Eagle Creek Storage

+

Hydraulic Improvements



N

Miles
0 0.35 0.7 1.4 2.1 2.8 3.5

Stantec

1% ACE Flood

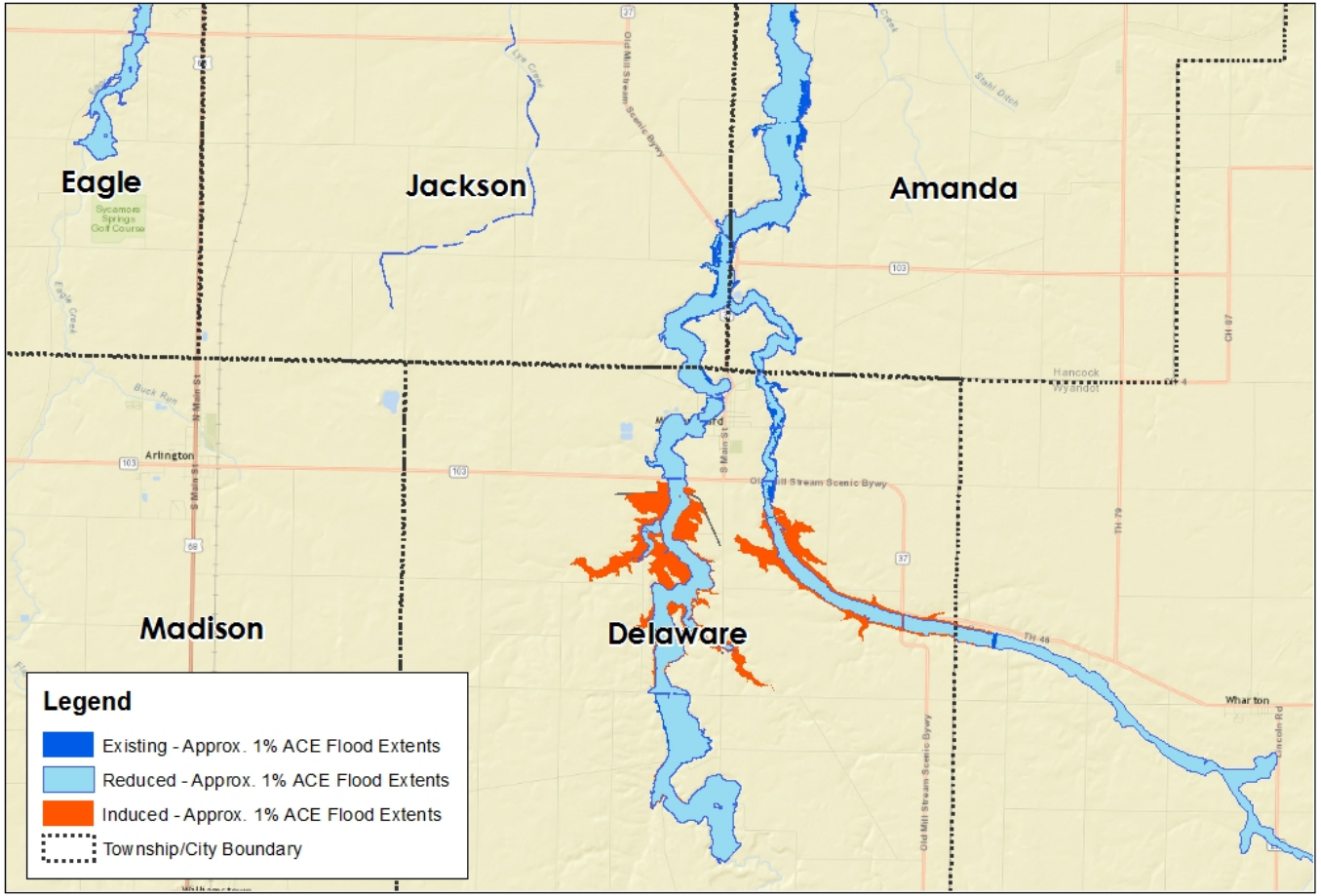
Mt. Blanchard Storage

+

Eagle Creek Storage

+

Hydraulic Improvements



Stantec

1% ACE Flood

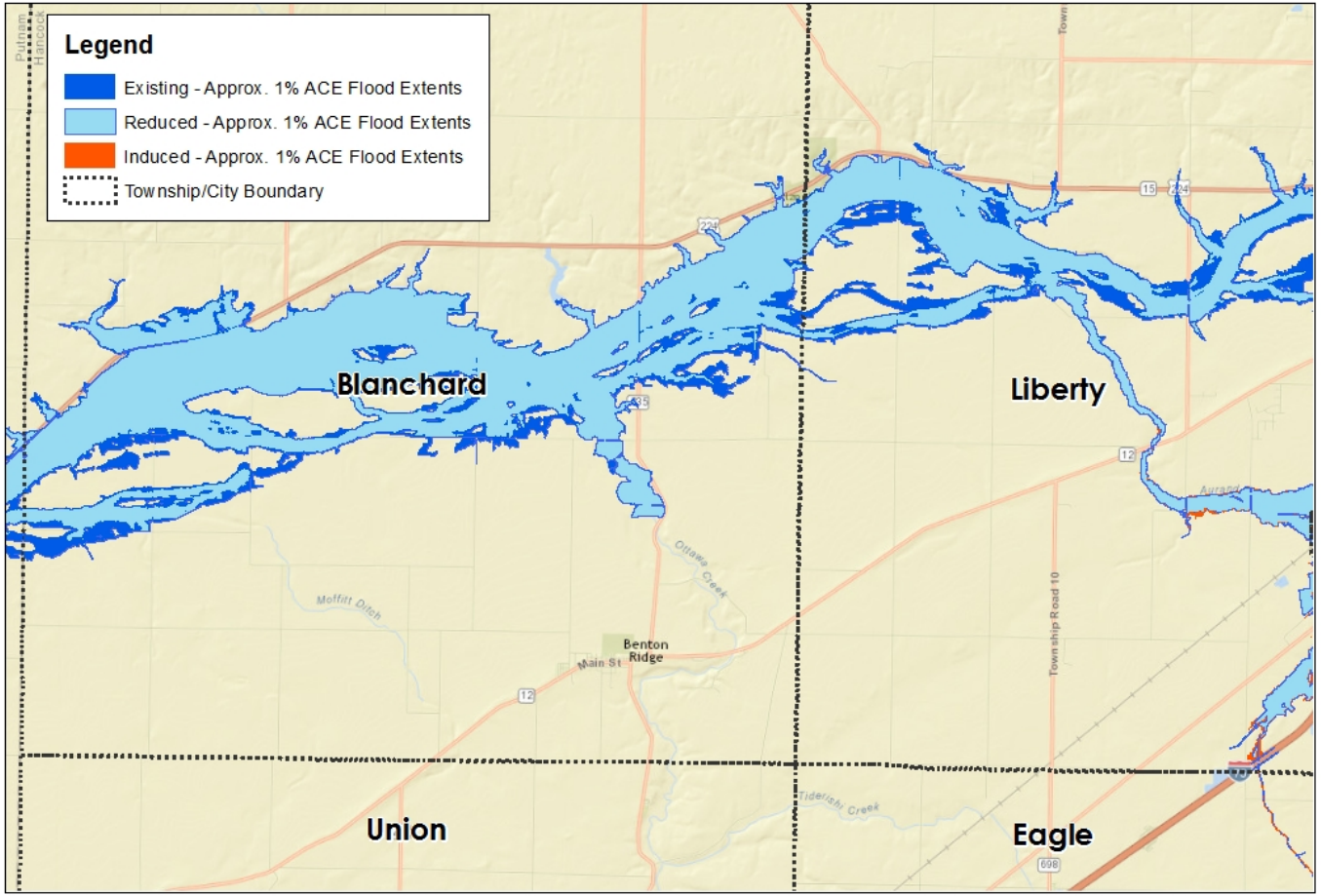
Mt. Blanchard Storage

+

Eagle Creek Storage

+

Hydraulic Improvements



N

Miles
0 0.3 0.6 1.2 1.8 2.4 3

Stantec

Path Forward

- Stantec Finalize Draft Report
  - April 3, 2017
  - Benefit to Cost Ratio Report
  - Hydrology & Hydraulics Report
- Community Review and Consider Options
  - Open Houses at City and Township Level
  - Scheduled after April 3, 2017
- MWCD Board & Conservancy Court – May 2017
  - Will consider authorizing Blanchard River Improvements
- MWCD Update Official Plan
  - Court will review Stantec report to determine the additional information needed to amend the District's official plan

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Questions

www.HancockCountyFlooding.com

Hancock County Flood Risk Reduction Program Report

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