Blanco Riverine Flood Mitigation Project

City Council Work Session

Tuesday, October 16, 2018

Agenda

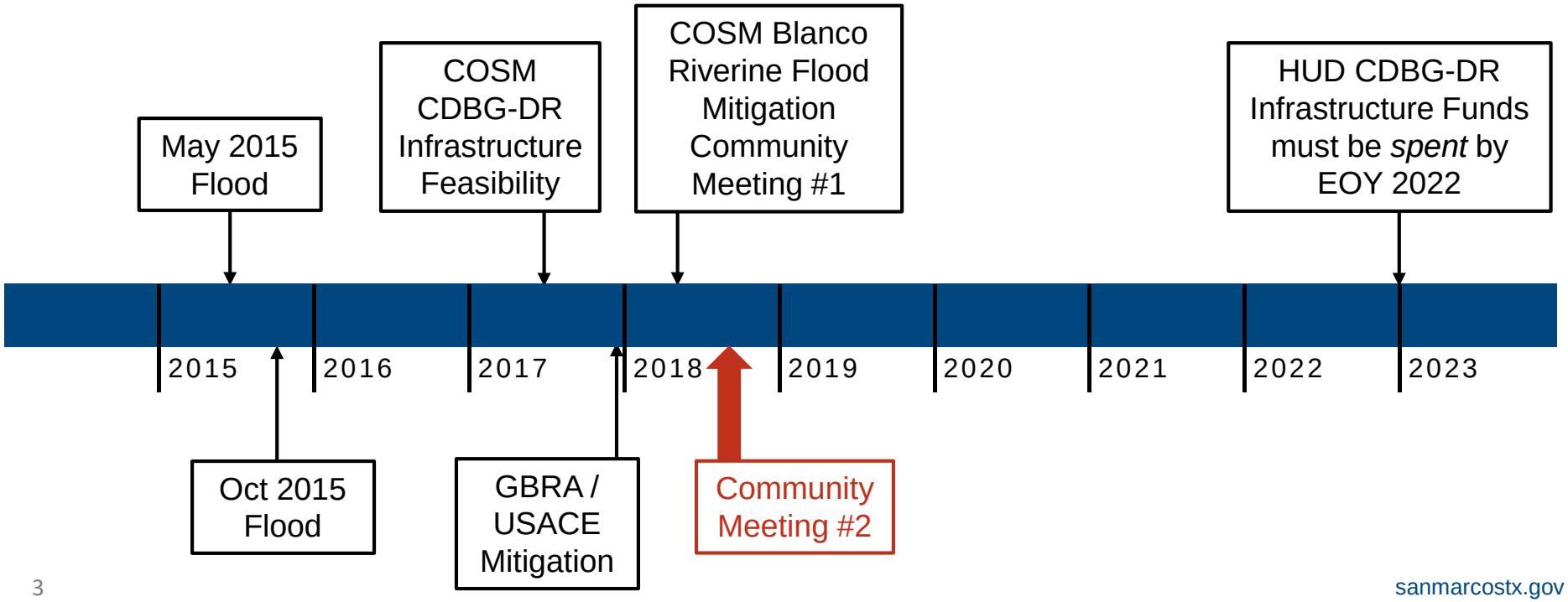
- Background / Timeline
- Near-Term Flood Control Options Evaluated
- Preliminary Results
- Questions/discussion
- Long-Term Flood Control Options & Discussion*

* Time Permitting

Background

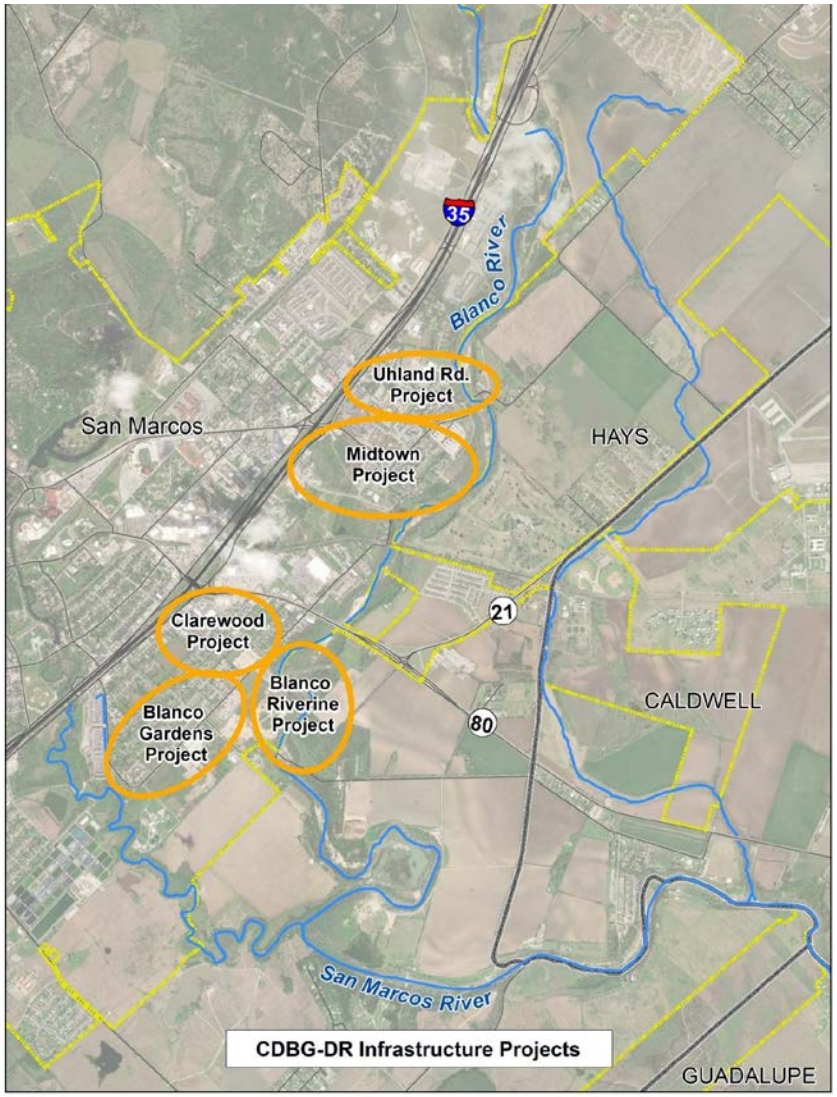
CDBG-(DR) Disaster Recovery Funds

- San Marcos received a $25 million allocation from the HUD
- Administration, Planning, Housing, and Infrastructure
- The Blanco Riverine Project is one of the Infrastructure Projects

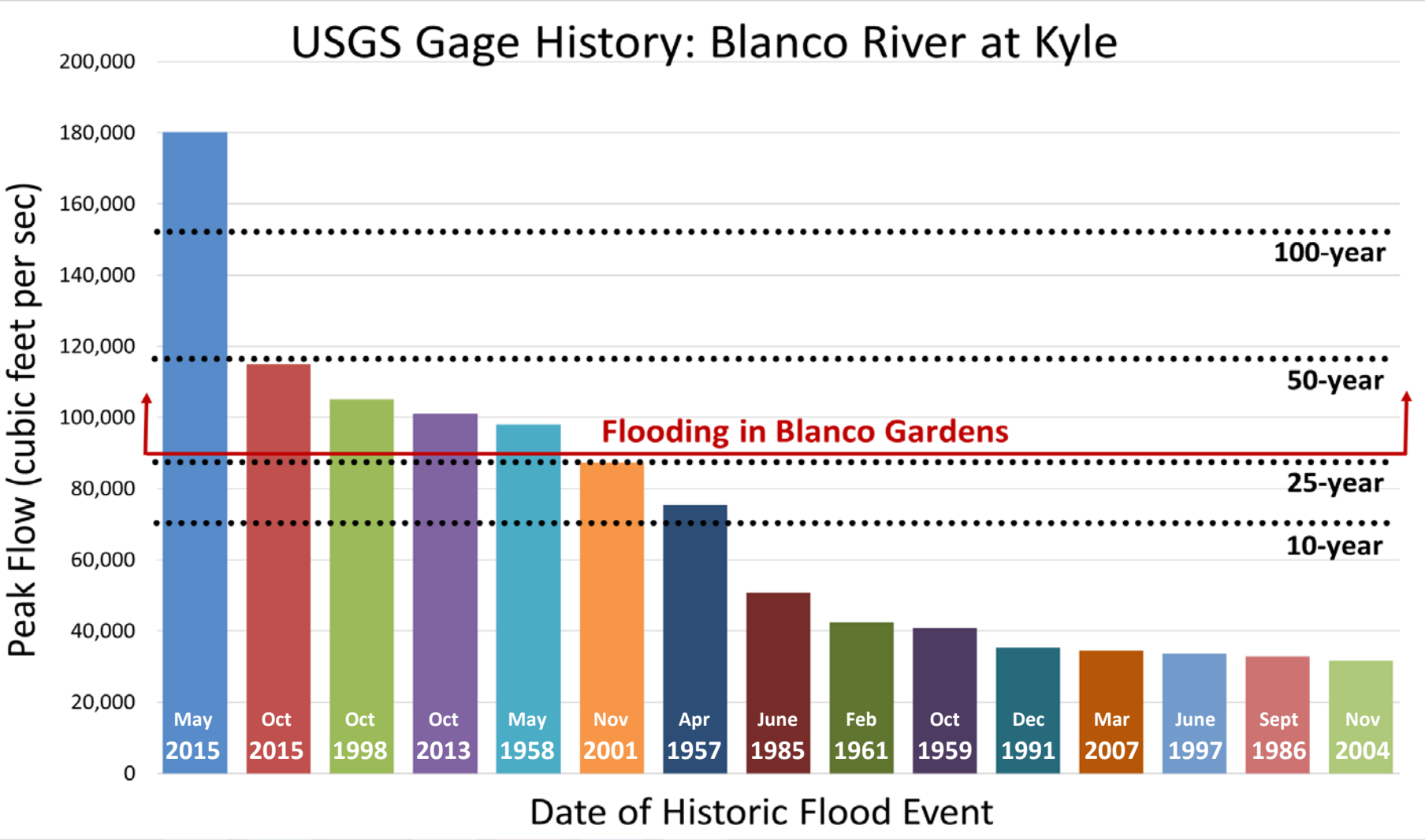


CDBG-DR Infrastructure Projects

- Uhland Road
- Midtown
- Clarewood
- Blanco Riverine
- Blanco Gardens



Blanco River History



Existing Condition - Structures Inundated

25-year Structures

- 0 Blanco Gardens
- 79 Other Areas

50-year Structures

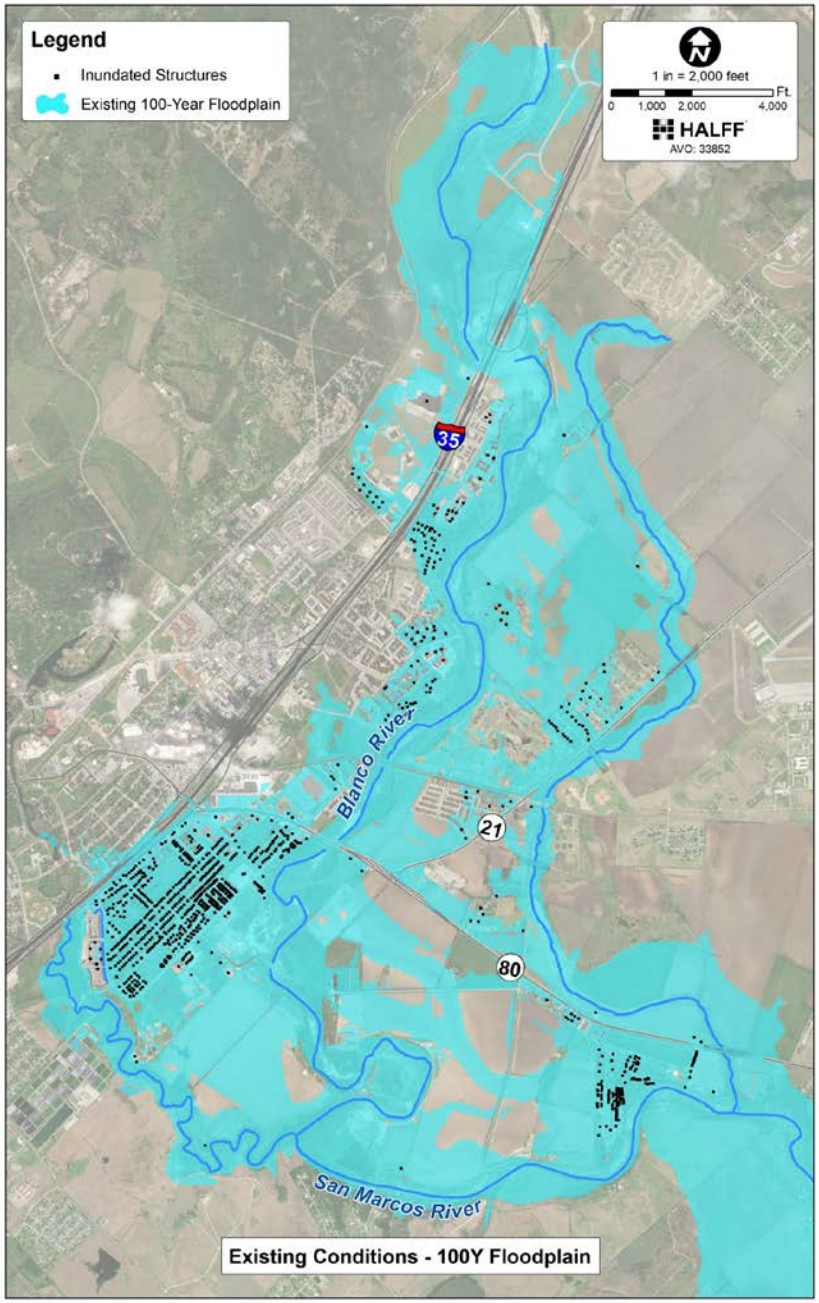
- 436 Blanco Gardens
- 128 Other Areas

100-year Structures

- 652 Blanco Gardens
- 328 Other Areas

500-year Structures

- 765 Blanco Gardens
- 927 Other Areas

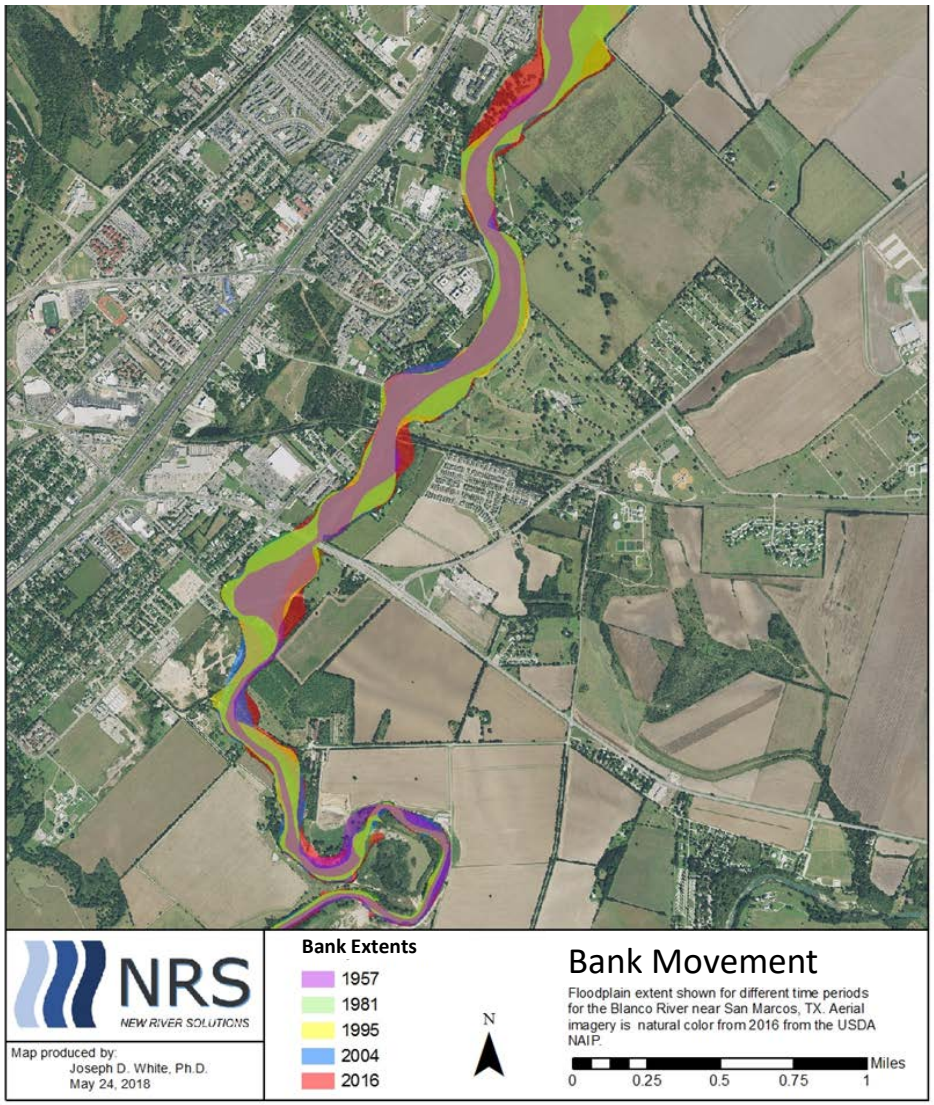


Community Meetings

- Attended by San Marcos, Martindale, and Hays County citizens, land owners, business operators, and renters who flooded
- 2- Public Meetings, 1- SMRF Hosted
- Comments/questions included:
  - Do not worsen flooding in Martindale or outside of city limits
  - Consider flood impacts from future development
  - Consider effects on the natural rivers and environment
  - Consider natural flow patterns
  - Make improvements sooner than later
  - Coordinate work with other projects
  - Consider a regional approach

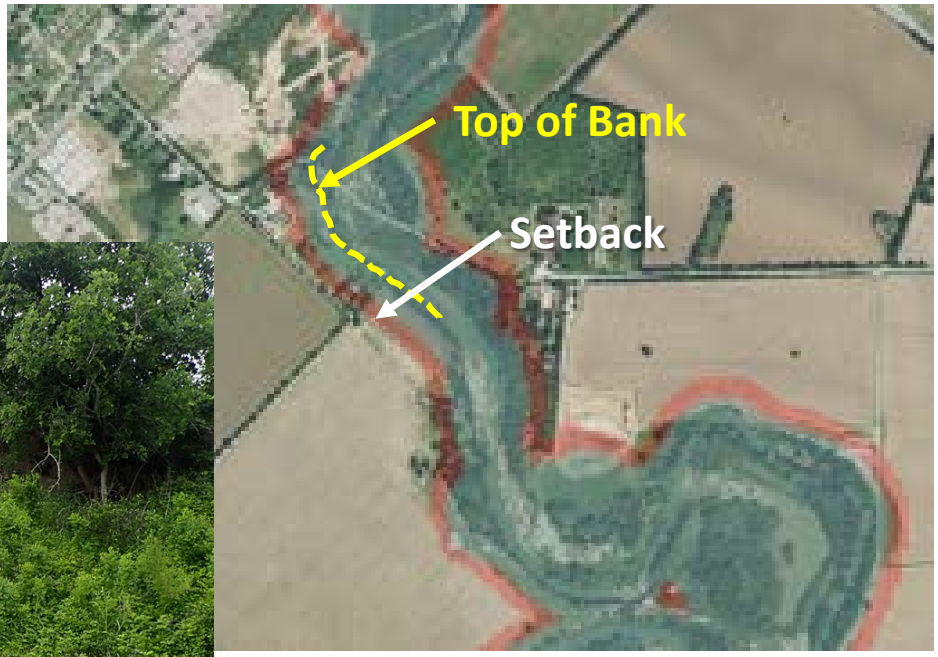
Riverine Geomorphology

- Analysis: Blanco River near IH-35 to San Marcos River Cummings Dam
  - Channel Migration Rate ~ 2 feet/year
  - Continual Aggregation / Degradation
  - Oxbow Analysis



Riverine Geomorphology

Setbacks for Erosion Hazard Zone



Environmental

- Archeological Issues likely high due to early human settlement along these rivers
- 18 Species Listed as Threatened or Endangered
- TCEQ Database shows one hazardous site within one mile
- NEPA process (due to Federal funding)

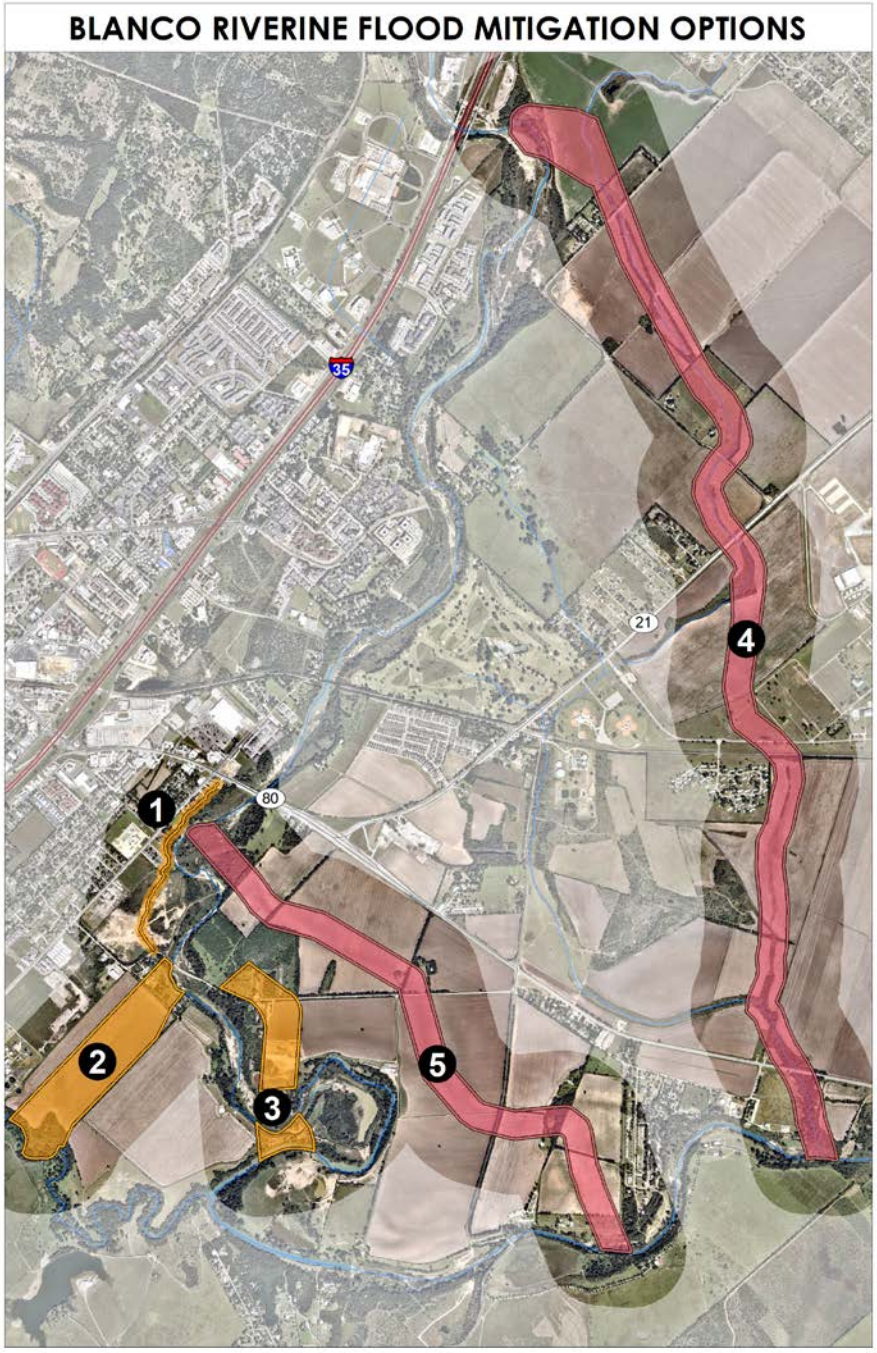
Flood Control Options Considered

Near-Term Solutions

- Blanco Gardens Berm (1)
- Diversion 2
- Diversion 3

Long-Term Solutions

- Bypass of Bypass Creek (4)
- Diversion 5



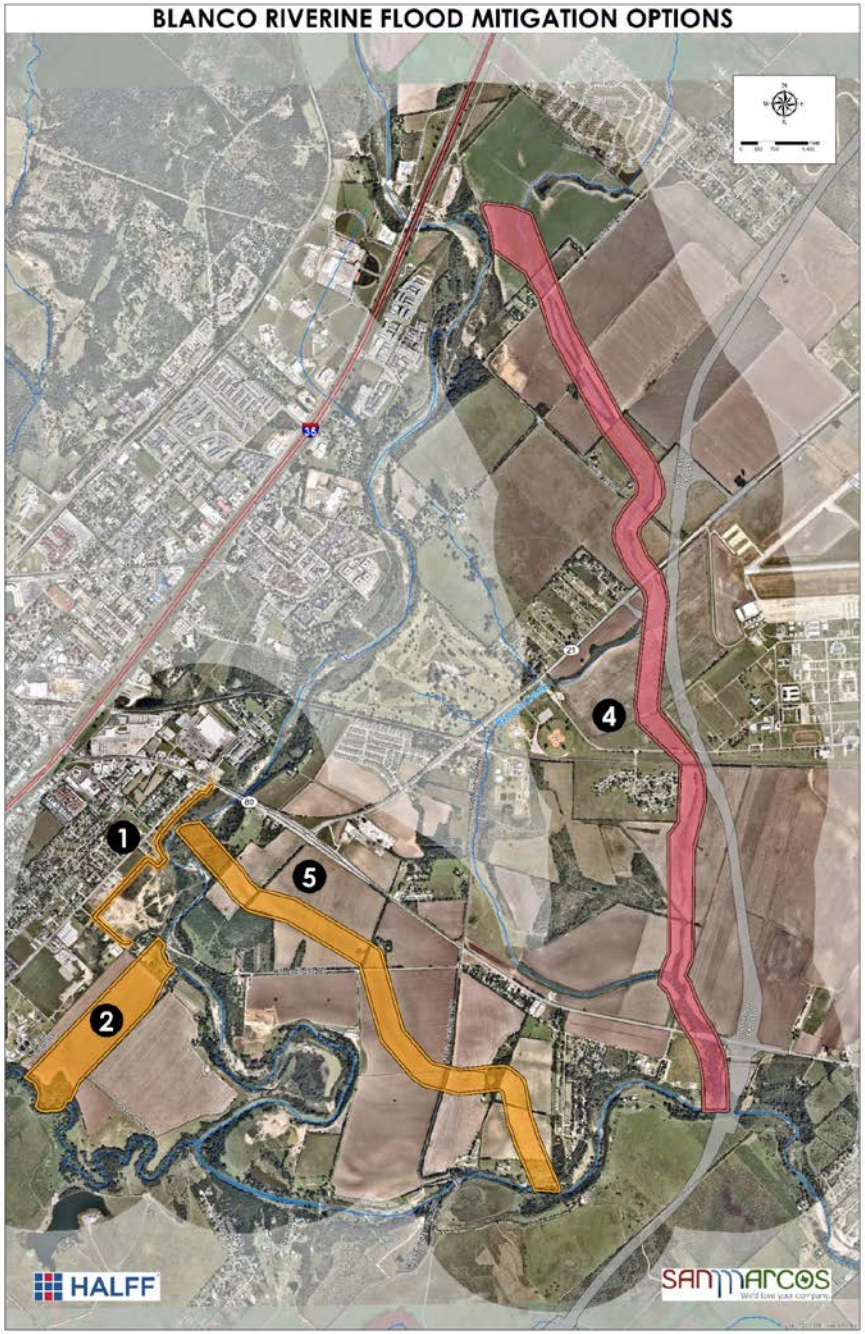
Flood Control Options Evaluated

Near-Term Solutions

- Blanco Gardens Berm (1)
- Diversion 2
- ~~Diversion 3~~
- Partial Bypass of Bypass Creek (4)
- Diversion 5

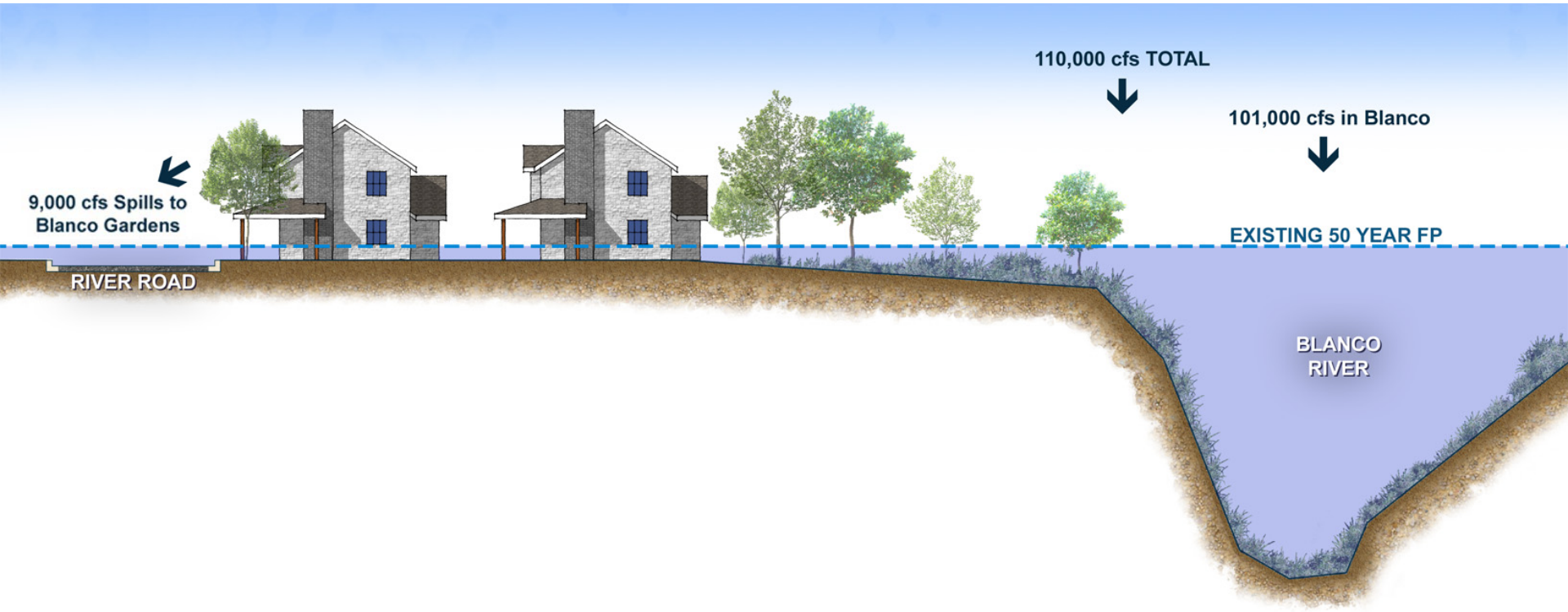
Long-Term Solutions

- Full Bypass of Bypass Creek (4)
- Detention



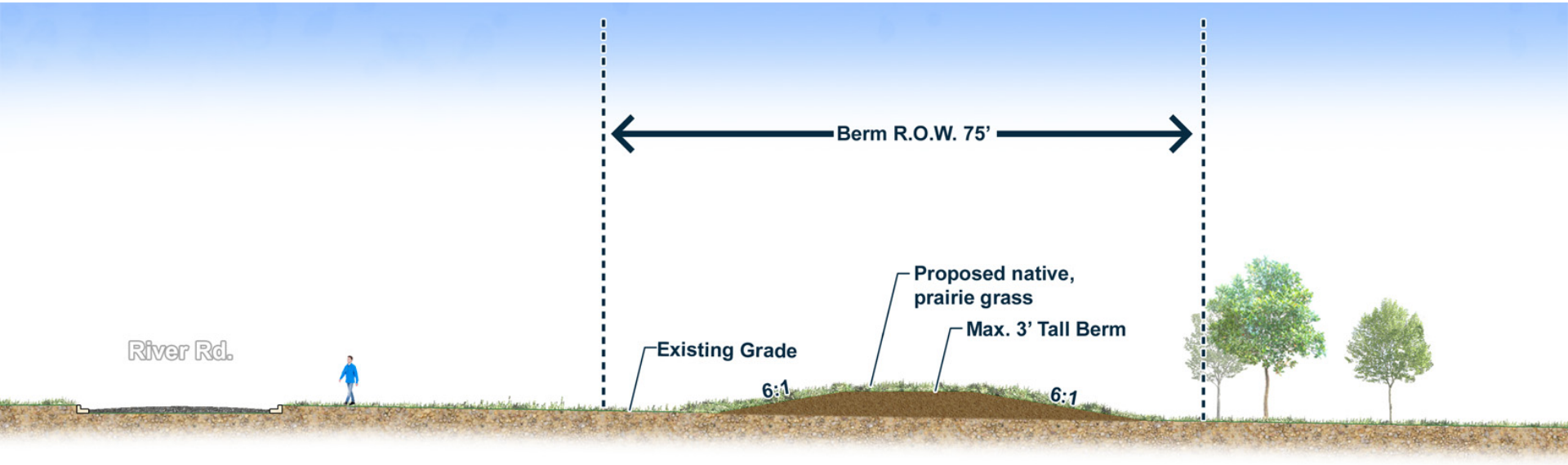
Blanco Gardens – Existing Condition

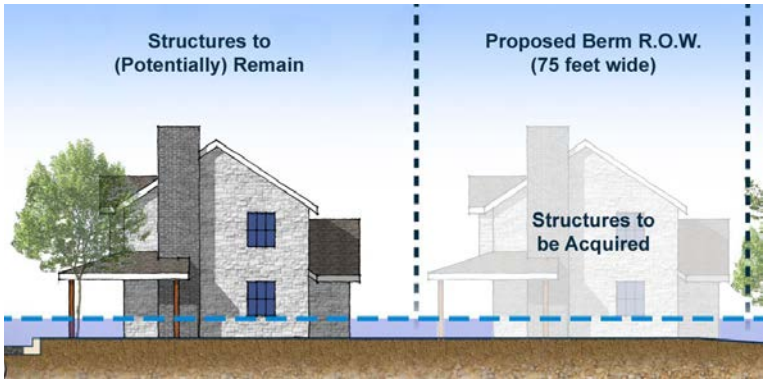
- Blanco River spills into neighborhood in 50-year event



Blanco Gardens – Near-Term Solution

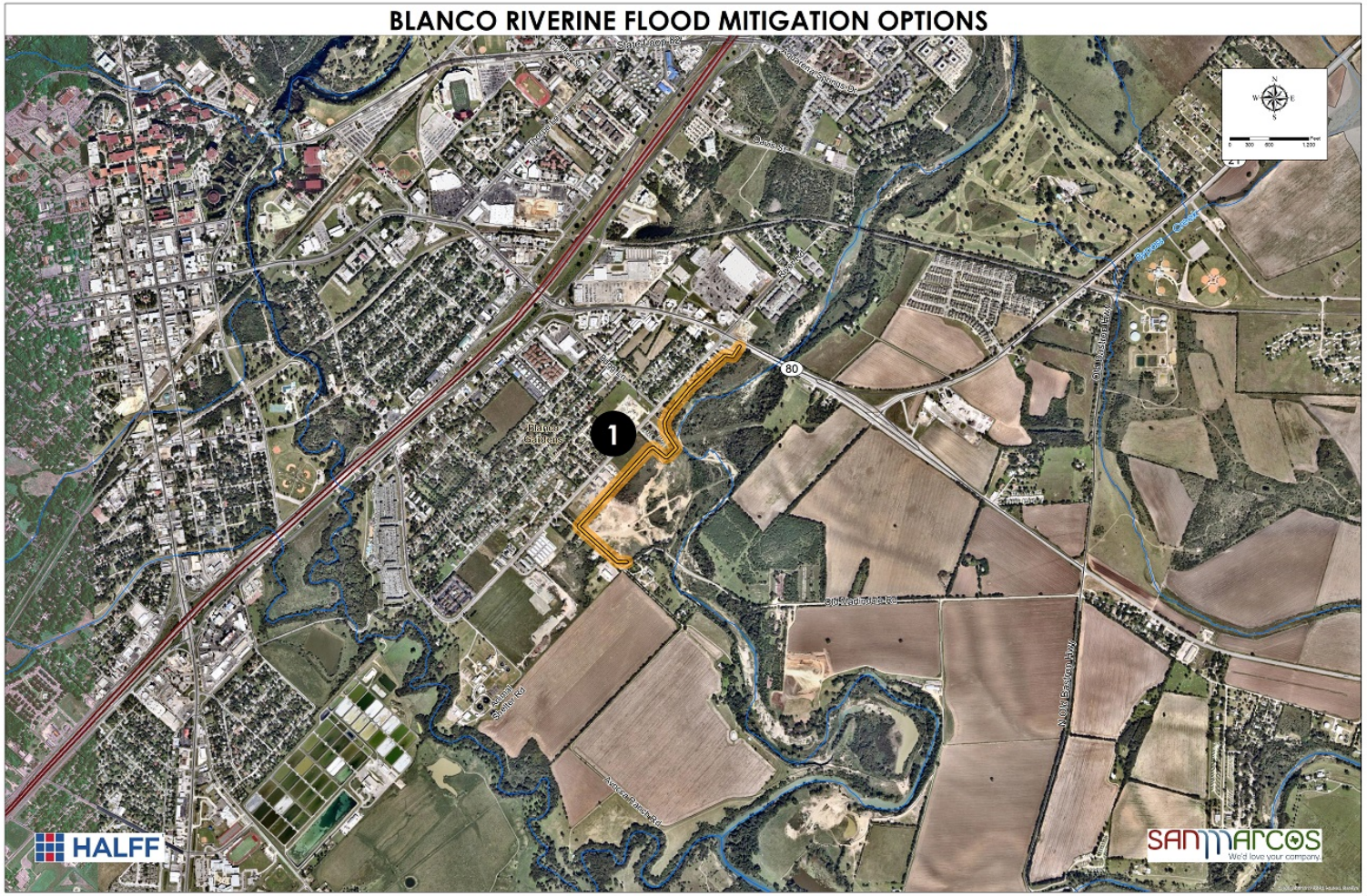
- Berm Alignment





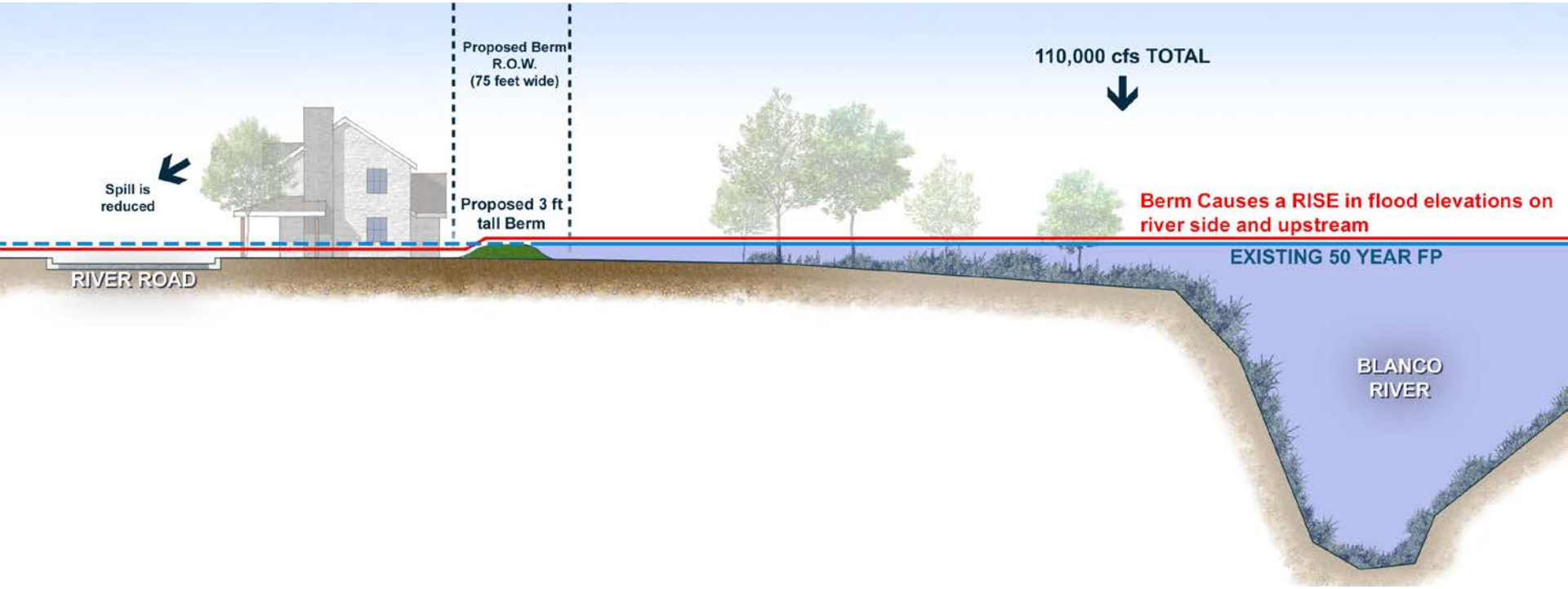
Blanco Gardens – Near-Term Solution

- **Berm Only**



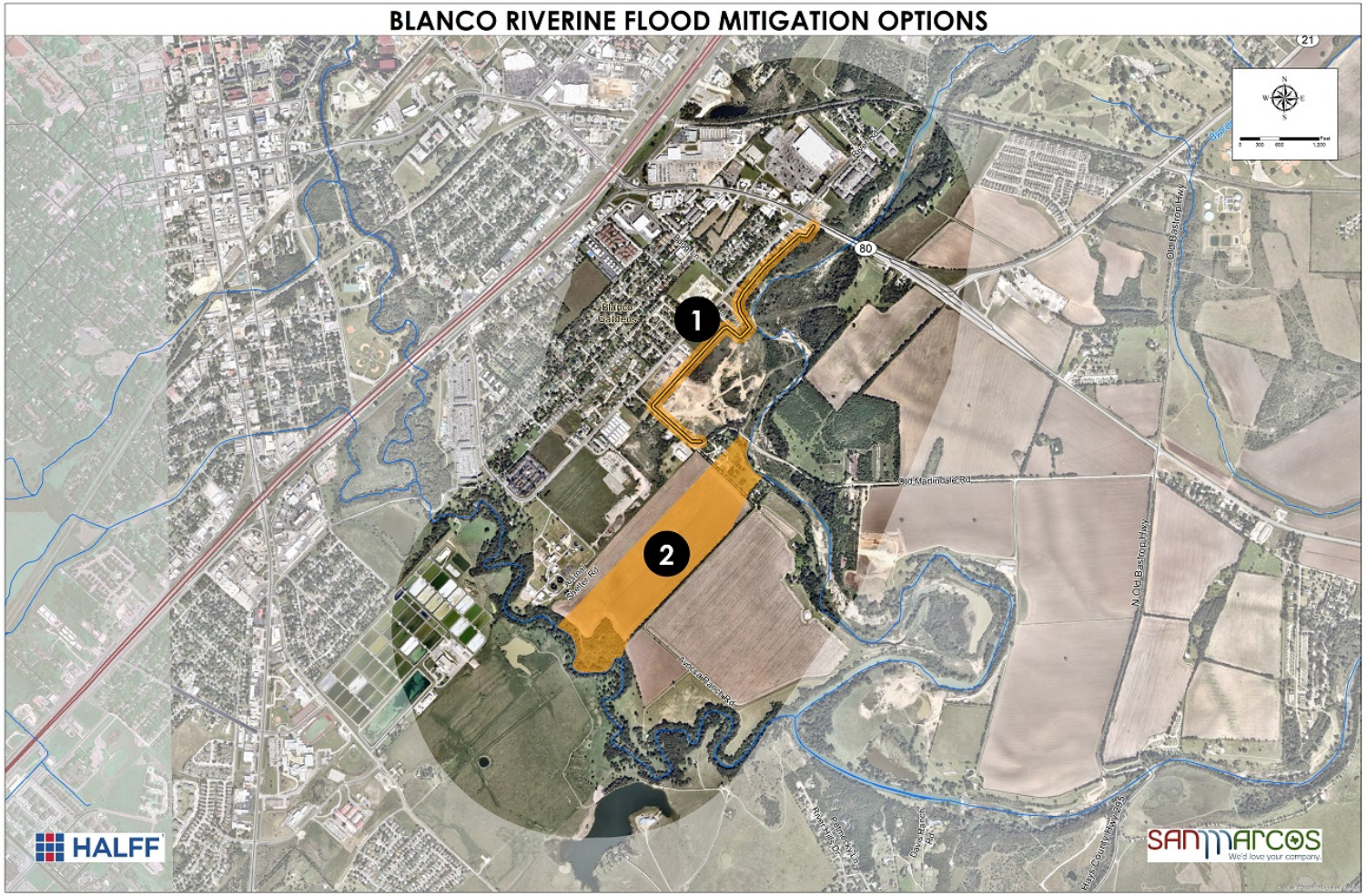
Blanco Gardens – Near-Term Solution

- **Berm Only**
  - $7 million project
  - 176 structures benefitted in 100-year event
  - > 1,000 structures **adversely** affected



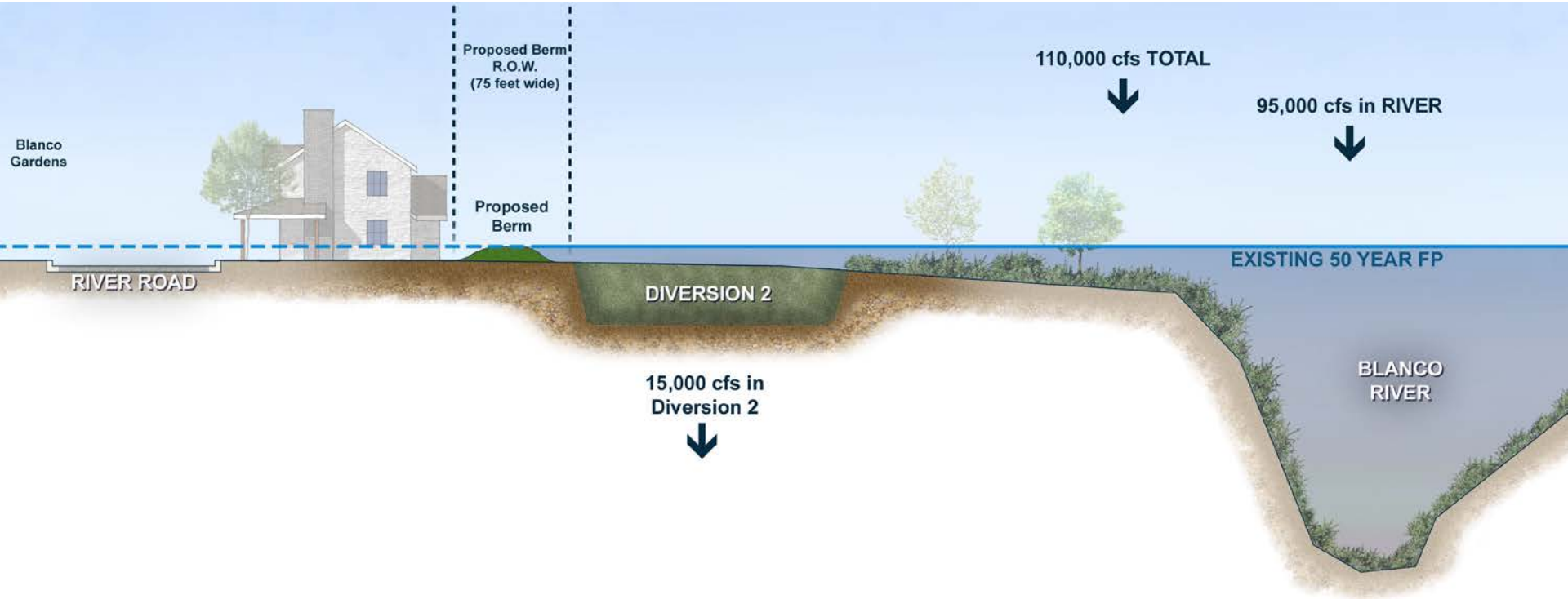
Blanco Gardens – Near-Term Solution

- **Berm + Diversion 2**



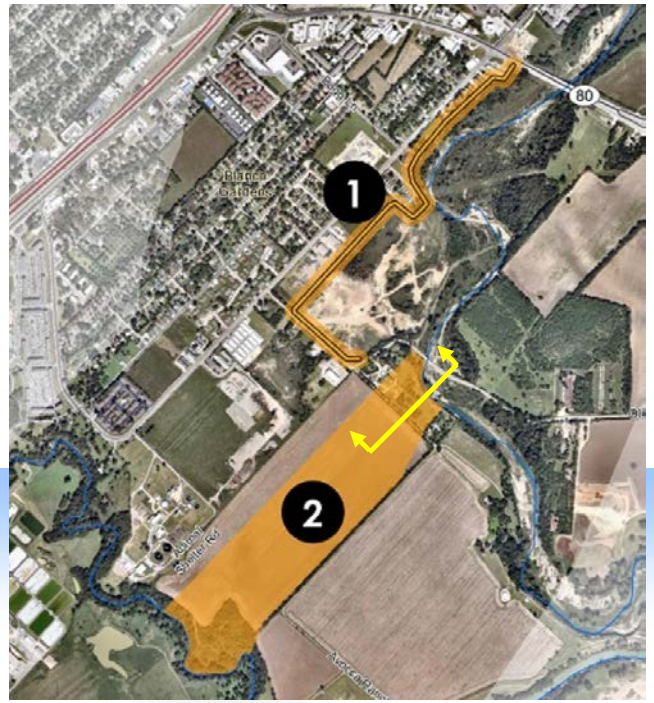
Blanco Gardens – Near-Term Solution

- **Berm + Diversion 2**
  - $14 million project
  - 315 structures benefitted in 100-year event
  - No adverse impact



Blanco Gardens – Near-Term Solution

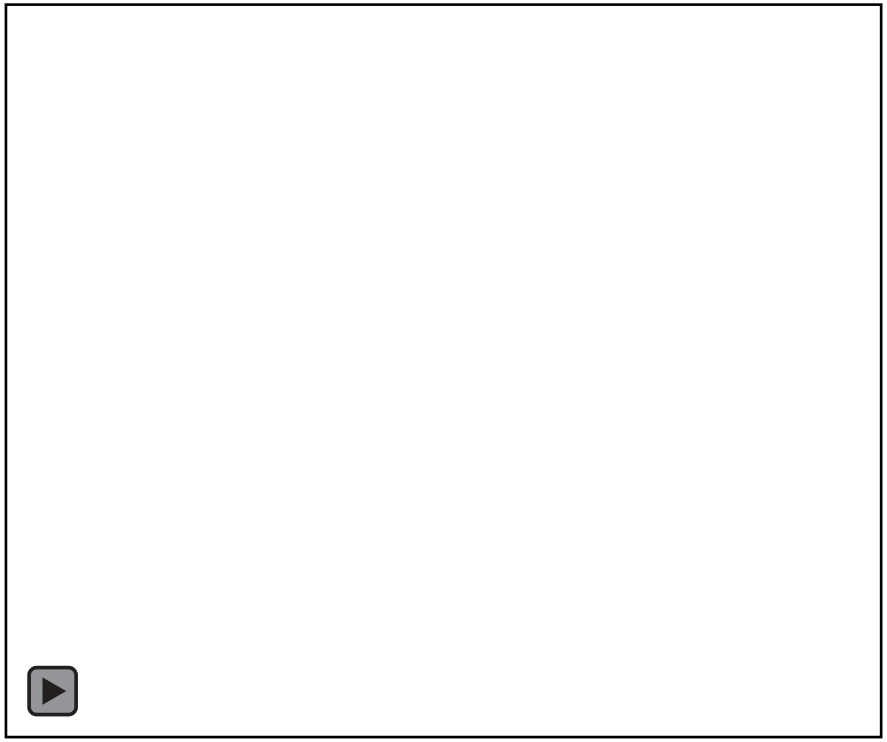
- Diversion 2 Cross Section
- Streambank stabilization



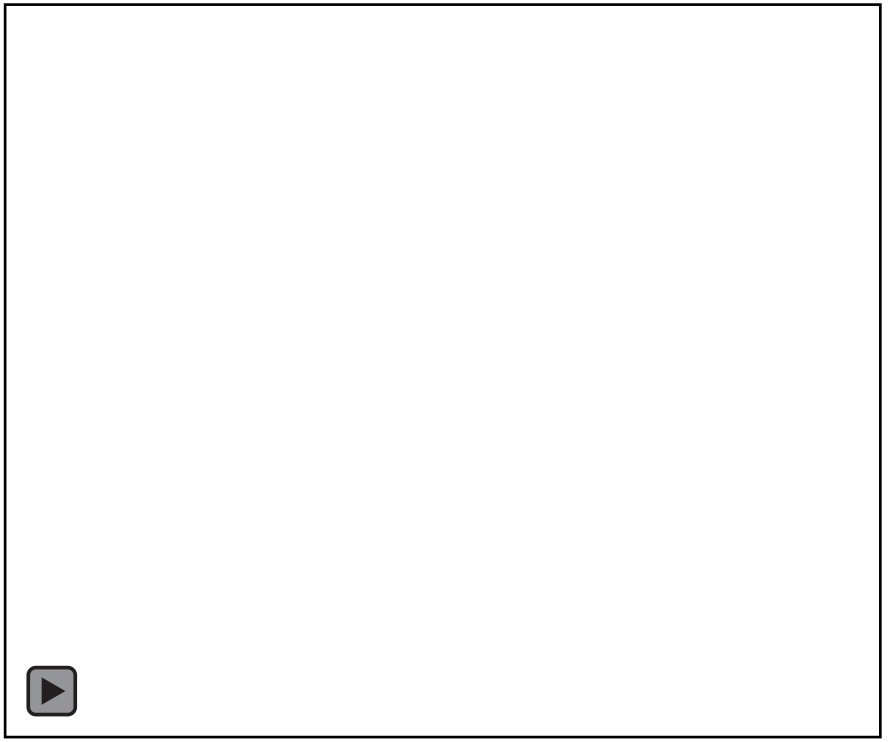
Blanco Gardens – Near-Term Solution

- **Blanco Gardens Spill Simulations**

Existing Condition: 100-year

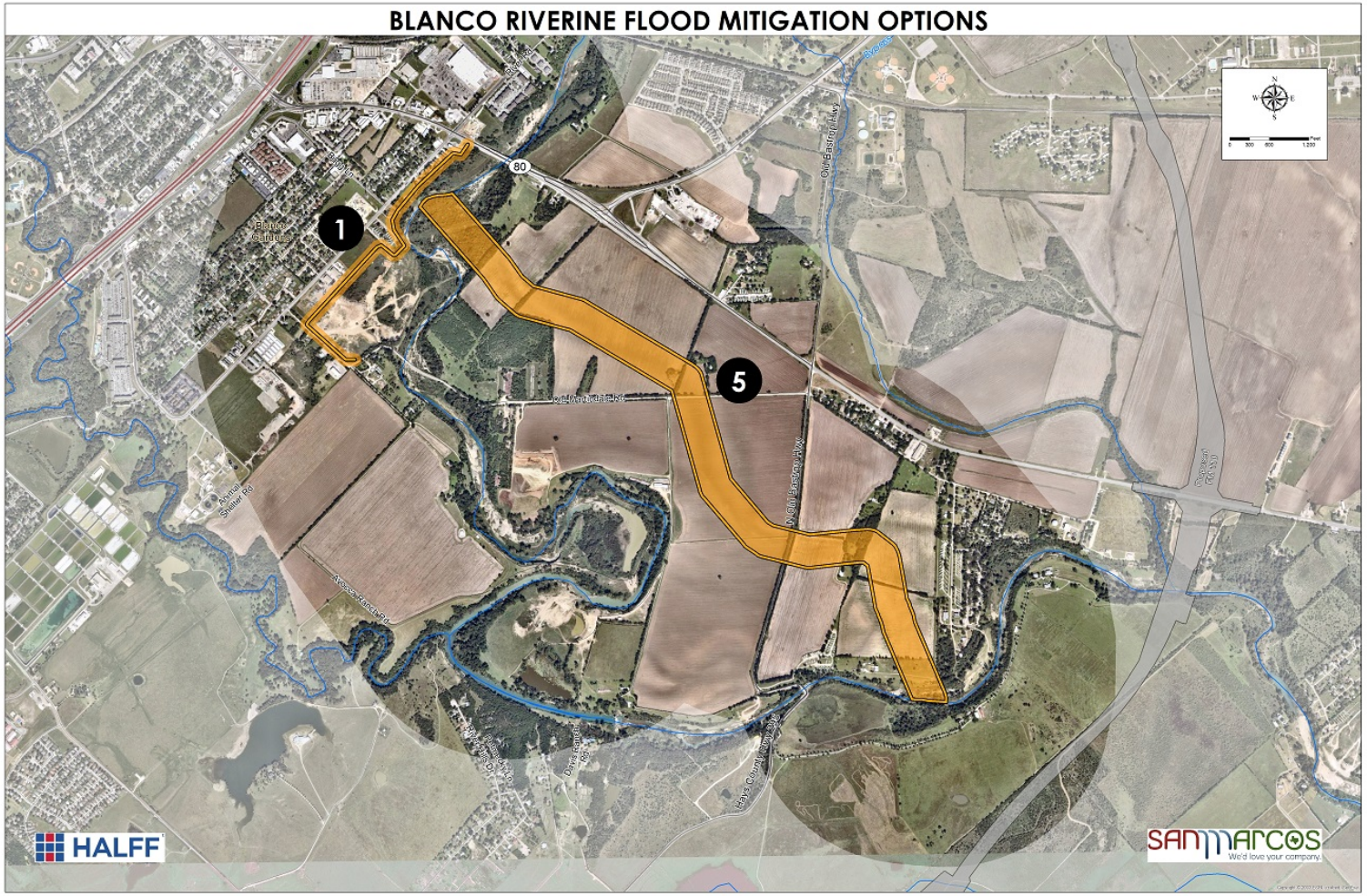


Near-Term: Berm + Diversion 2: 100-year



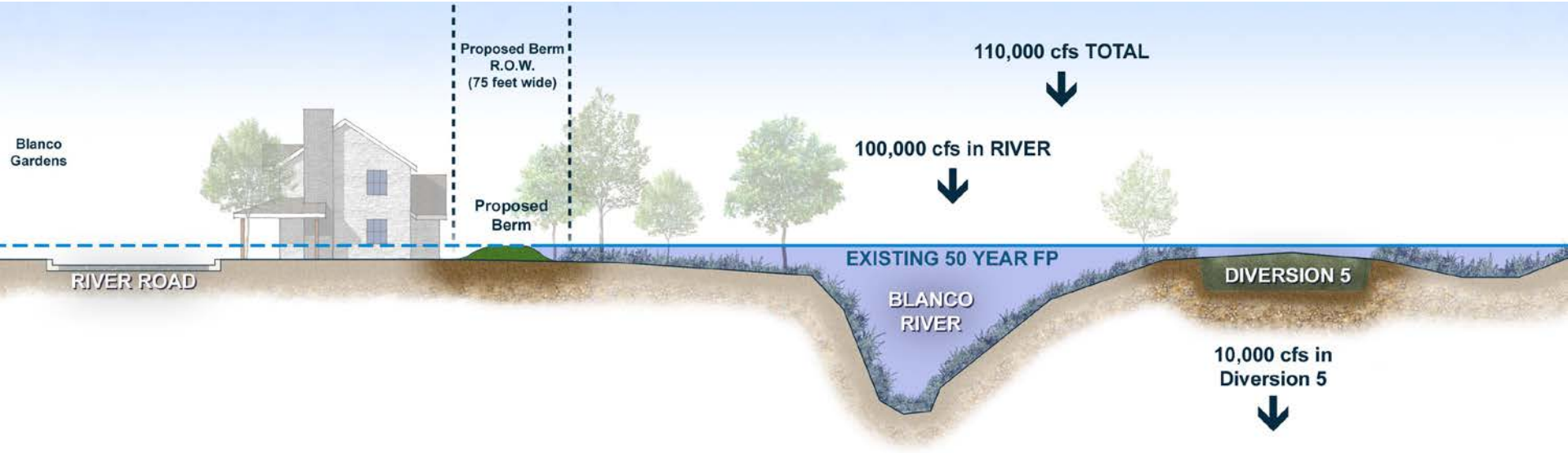
Blanco Gardens – Near-Term Solution

- **Berm + Diversion 5**



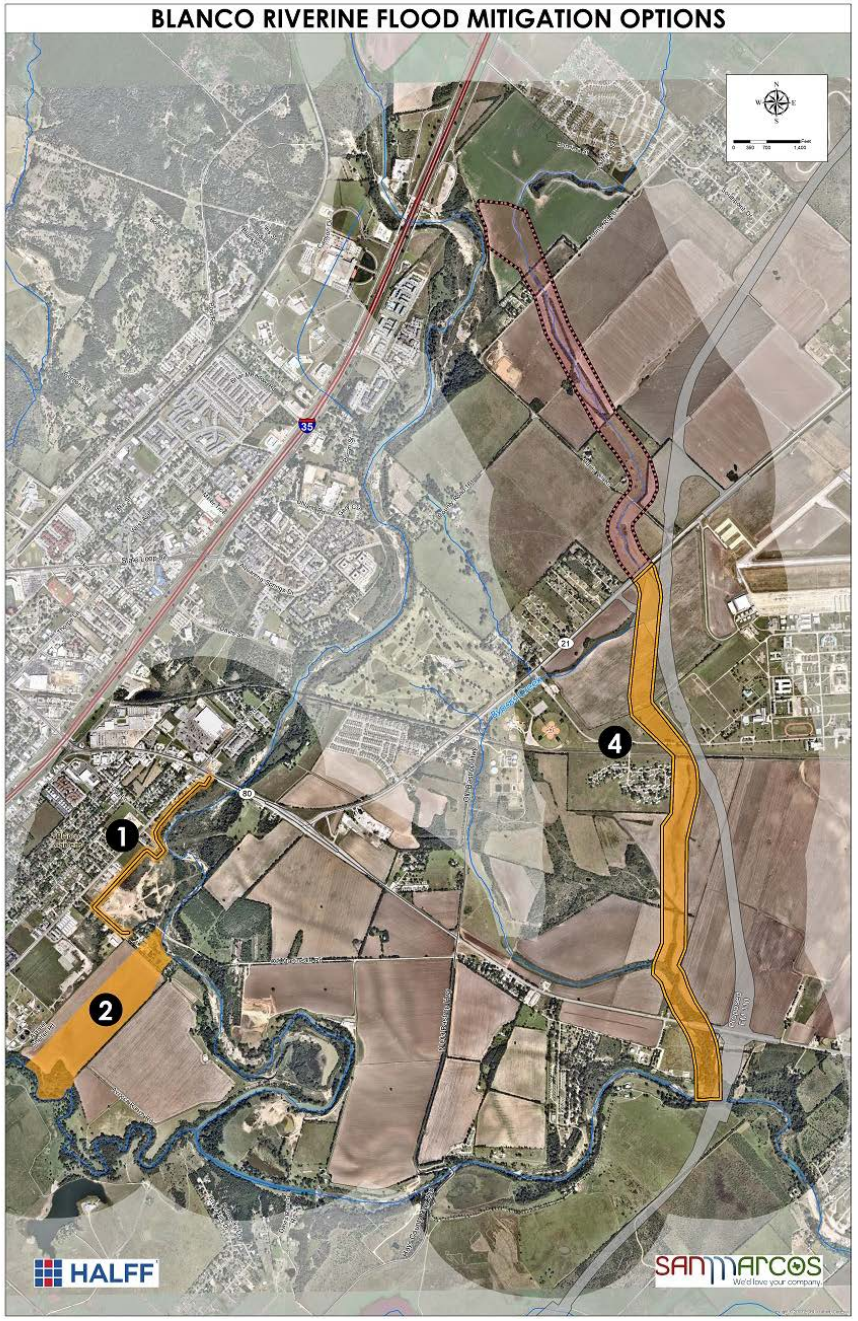
Blanco Gardens – Near-Term Solution

- **Berm + Diversion 5**
  - $22 million project
  - 321 structures benefitted in 100-year event
  - No adverse impact



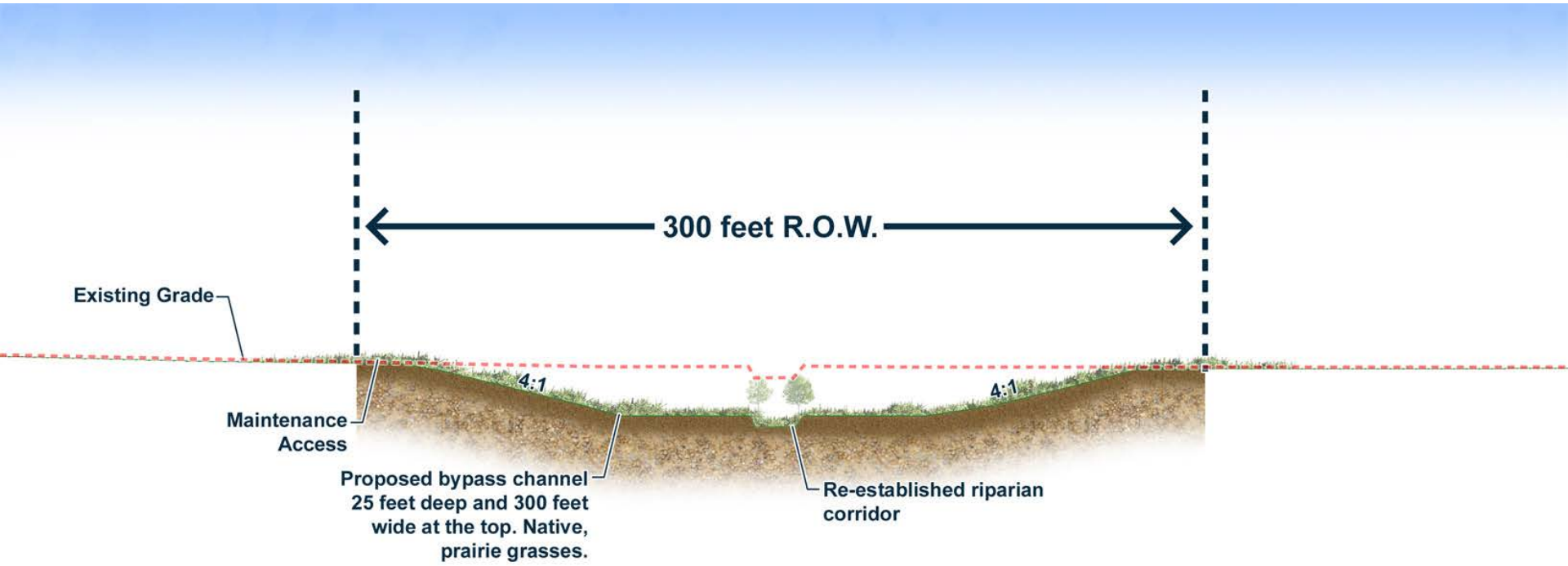
Blanco Gardens – Near-Term Solution

- **Berm + Diversion 2 + <u>Partial</u> Bypass Channel (part of 4)**



Blanco River – Near-Term Solution

- **Berm + Diversion 2 + Partial Bypass Channel (part of 4)**
  - $44 million project
  - 320 structures benefitted in 100-year event
  - No adverse impact



Preliminary Results

Options	Estimated Cost	No of 50-yr Structures Benefited	No of 100-yr Structures Benefited	No of 500-yr Structures Benefited	Mitigation Cost per Structure*
Near Term Options (Blanco Gardens Mitigation)					
Berm + Diversion 2	$14M	426	315	76	$44,000
Berm + Diversion 5	$22M	370	321	86	$69,000
Berm + Diversion 2 + Partial Bypass	$44M	427	320	94	$138,000

*Estimated project cost divided by the number of 100-year structures benefitted by the project.

Near-Term Preliminary Ranking

Point Value

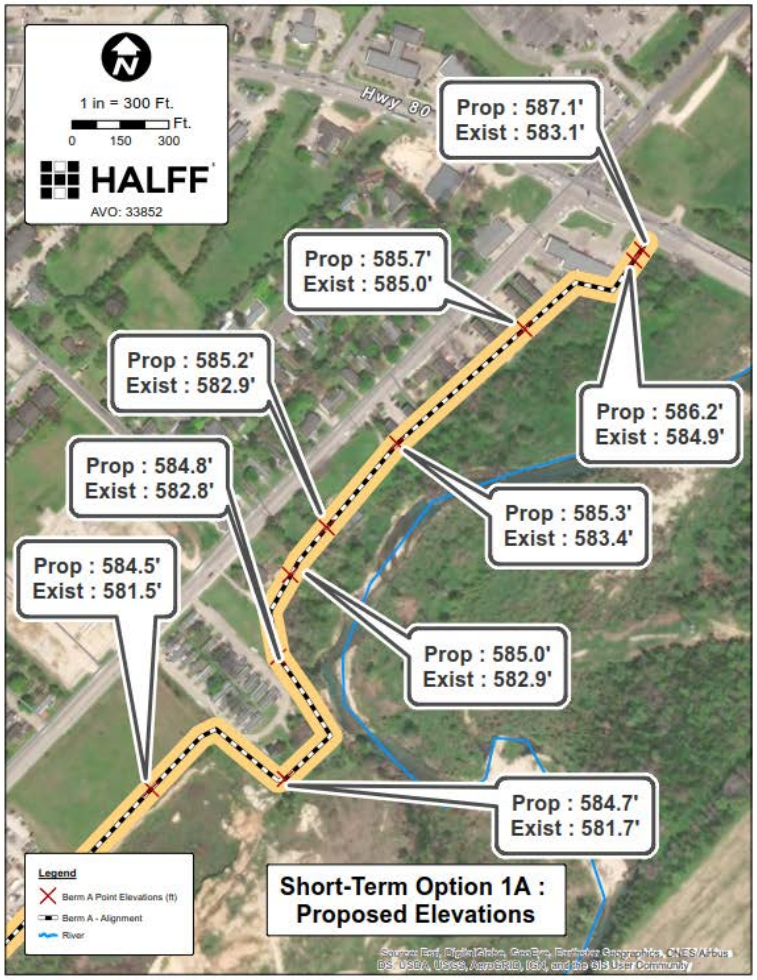
Highest Point Value

Lowest Point Value

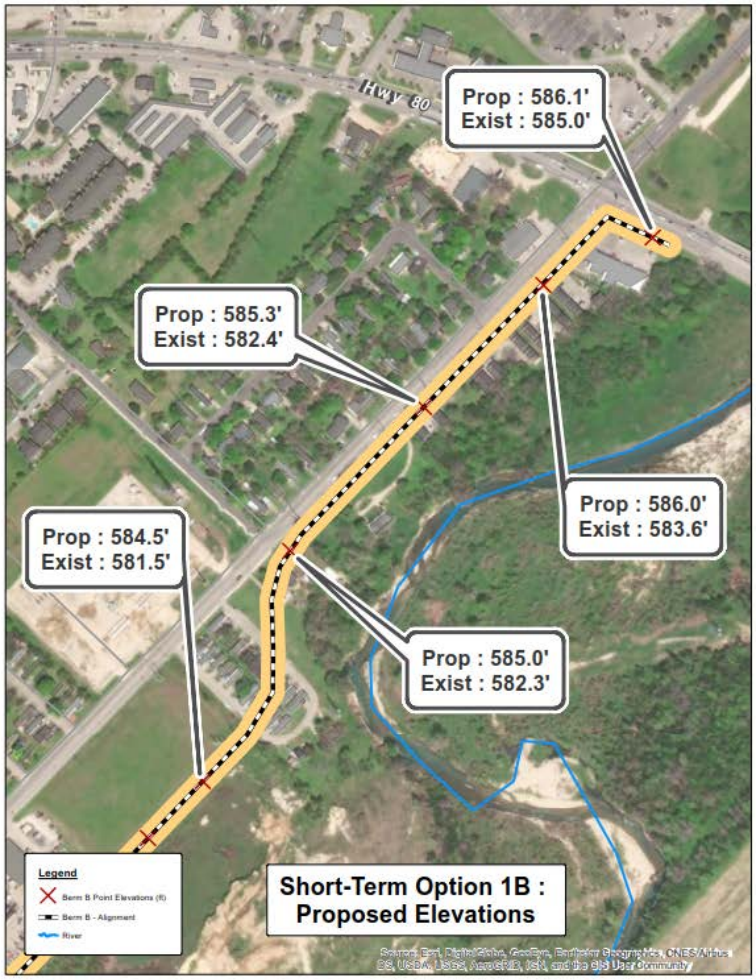
	% LMI Population Served	Flood Risk Reduction: Level of Service	Flood Risk Reduction: # Structures Benefitted	Cost per Benefitted Structure	ROW Acquisition	Leveraged Funding	Permitting / Schedule	Mobility Improvement	Phasing Considerations	Project Synergies	Environmental Impact	TOTAL SCORE (out of 100)	PROJECT RANKING
Berm + Diversion 2	16	4	5	10	5	5	7	3	3	3	3	**64**	**1**
Berm Only	16	0	0	10	7	5	10	2	3	3	3	**59**	**2**
Berm + Diversion 2 + Partial Bypass	18	4	5	0	4	0	0	4	5	5	5	**50**	**3**
Berm + Diversion 5	16	4	5	7	0	0	10	3	0	0	3	**48**	**4**

Blanco Gardens – Near-Term Solution

Berm A – Nearer Blanco

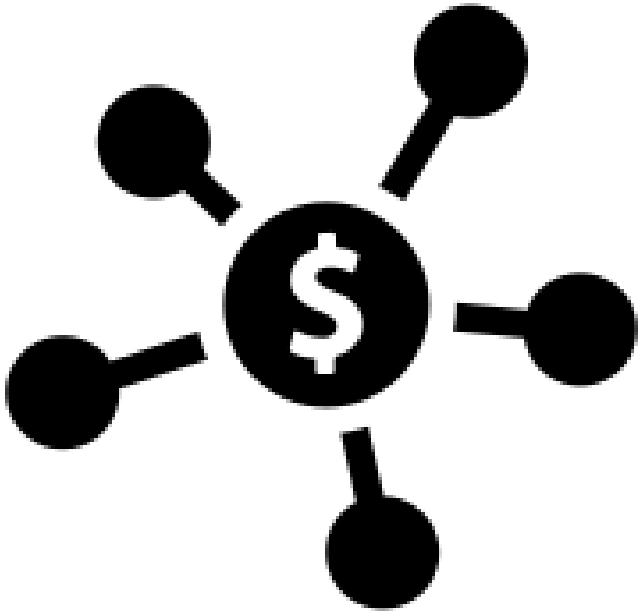


Berm B – Along River Rd



Near Term Project Funding

- Cost Estimate ~ $14,000,000
- TWDB $1,961,821
- CDBG-DR (2017) = $6,971,200
- Gap ~ $5,000,000
- CDBG-DR (2018) = TBD
- Potential City CIP funding



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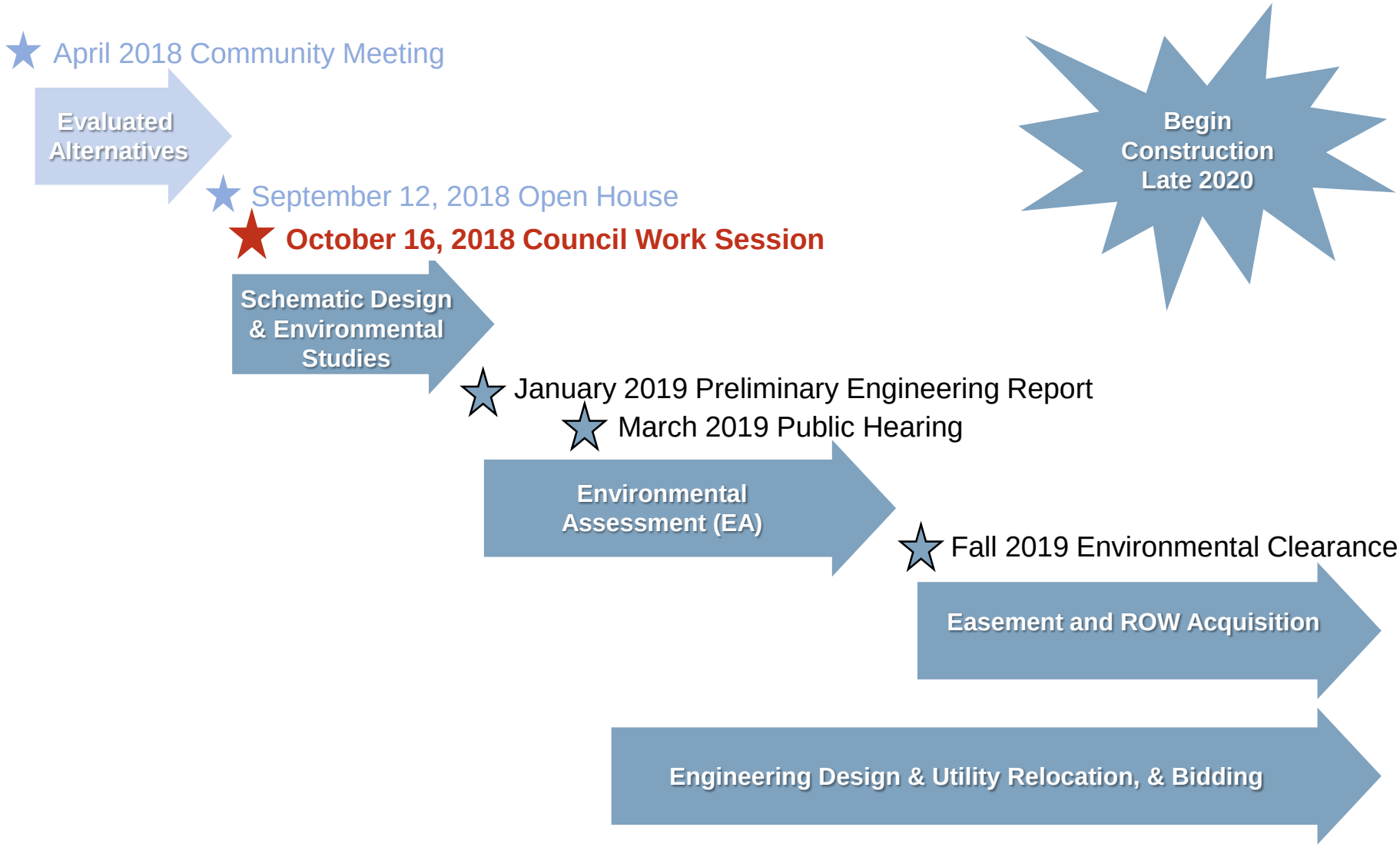
Next Steps – Near-Term Project



Questions / Discussions

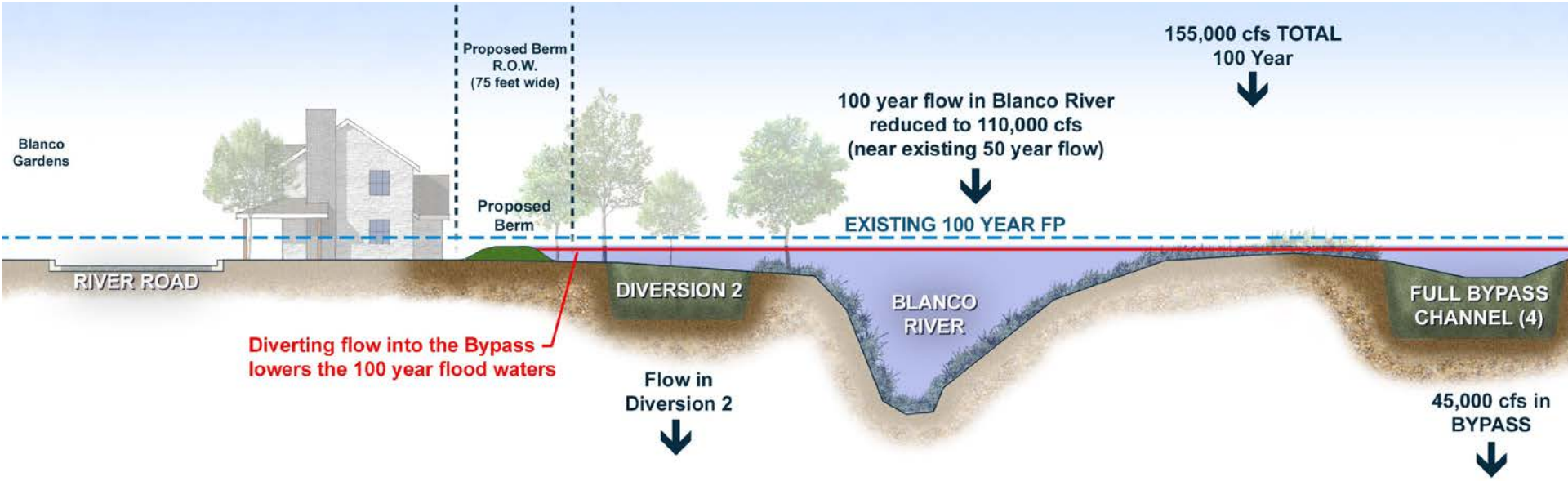
Blanco River – Long-Term Solutions

Blanco River – Long-Term Solution

- **Berm + Diversion 2 + <u>Full</u> Bypass Channel (4)**

Blanco River – Long-Term Solution

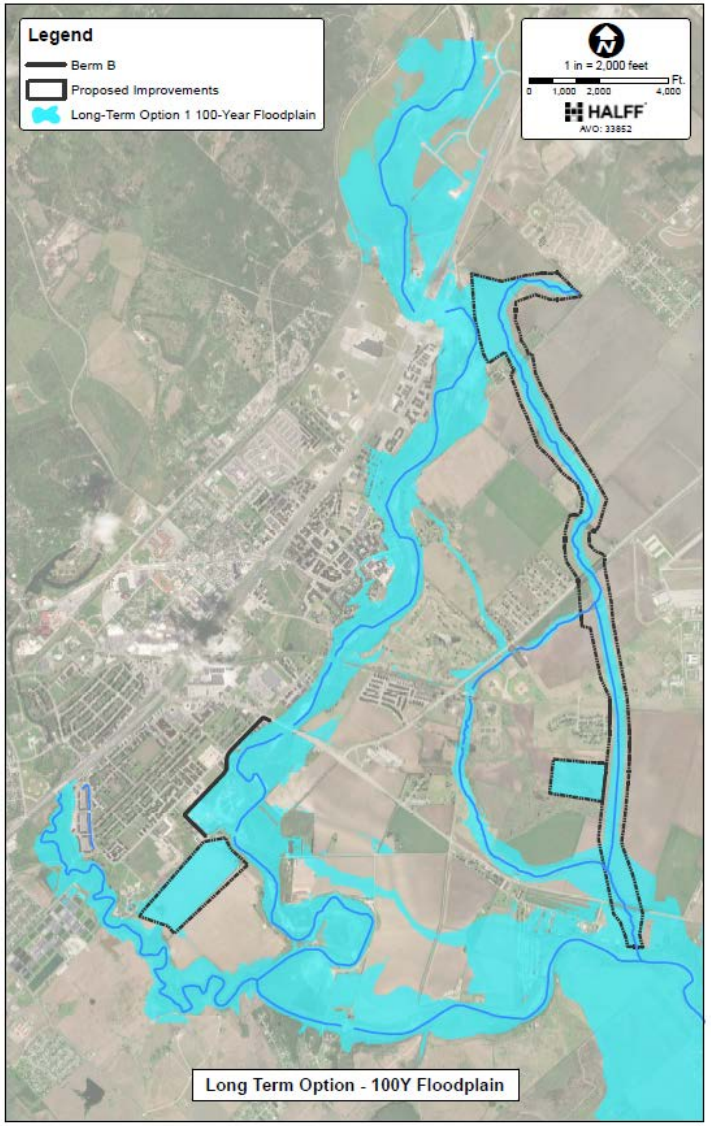
- **Berm + Diversion 2 + Full Bypass Channel (4)**
  - $74 million project
  - 836 structures benefitted in 100-year event
  - No adverse impact



Blanco River – Long-Term Solution

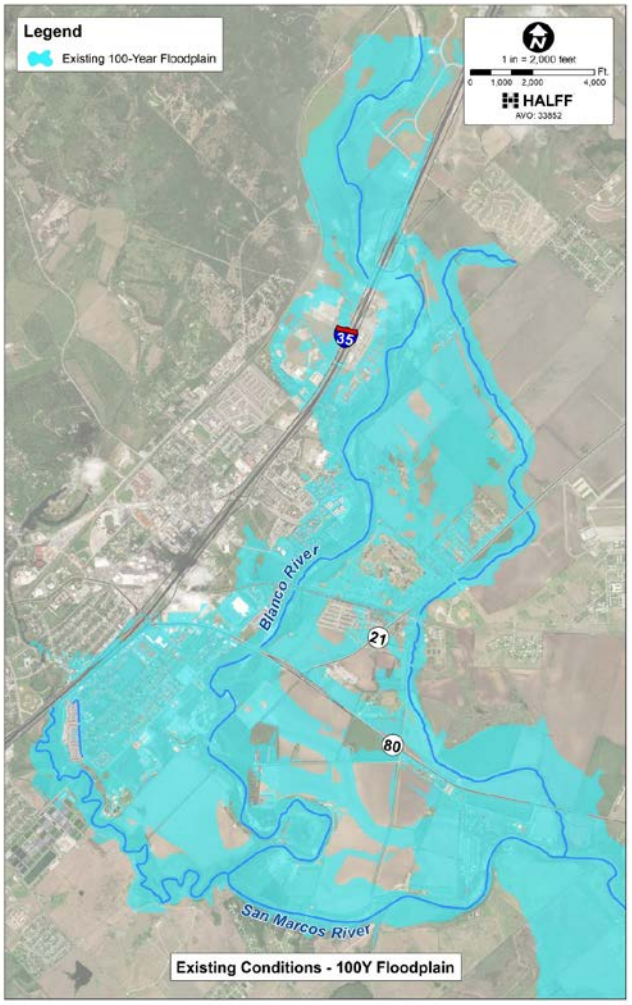
Mitigation of Impacts

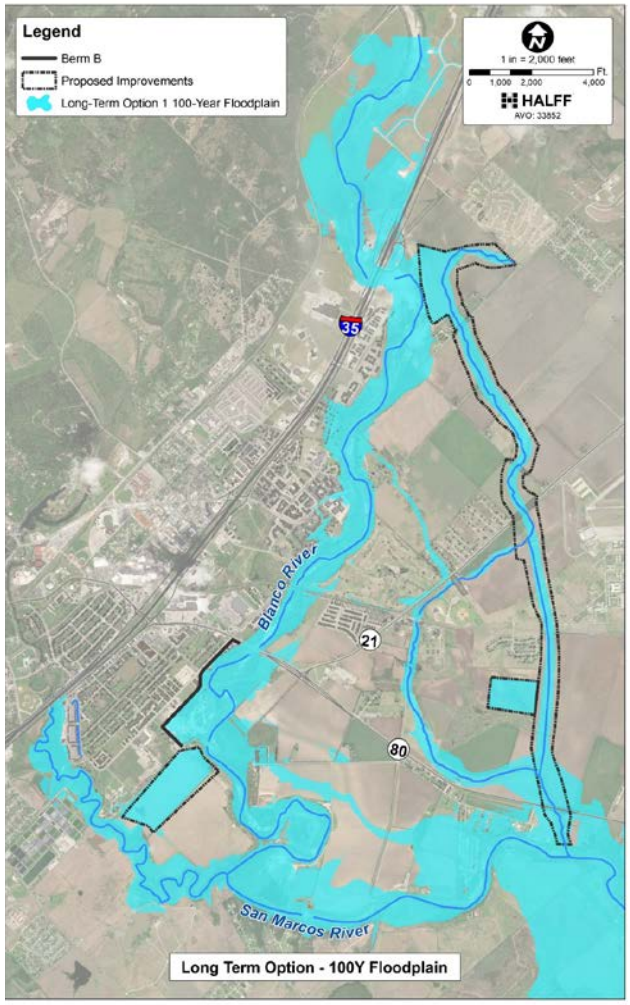
- Detention required on Bypass Creek
  - Pond required to achieve no adverse affect in Martindale
    - mitigates a 1-inch rise
  - Use city owned property for an approximate 30-40 acre pond



Blanco River – Long-Term Solution

- Reduces the amount of flooded area and structures

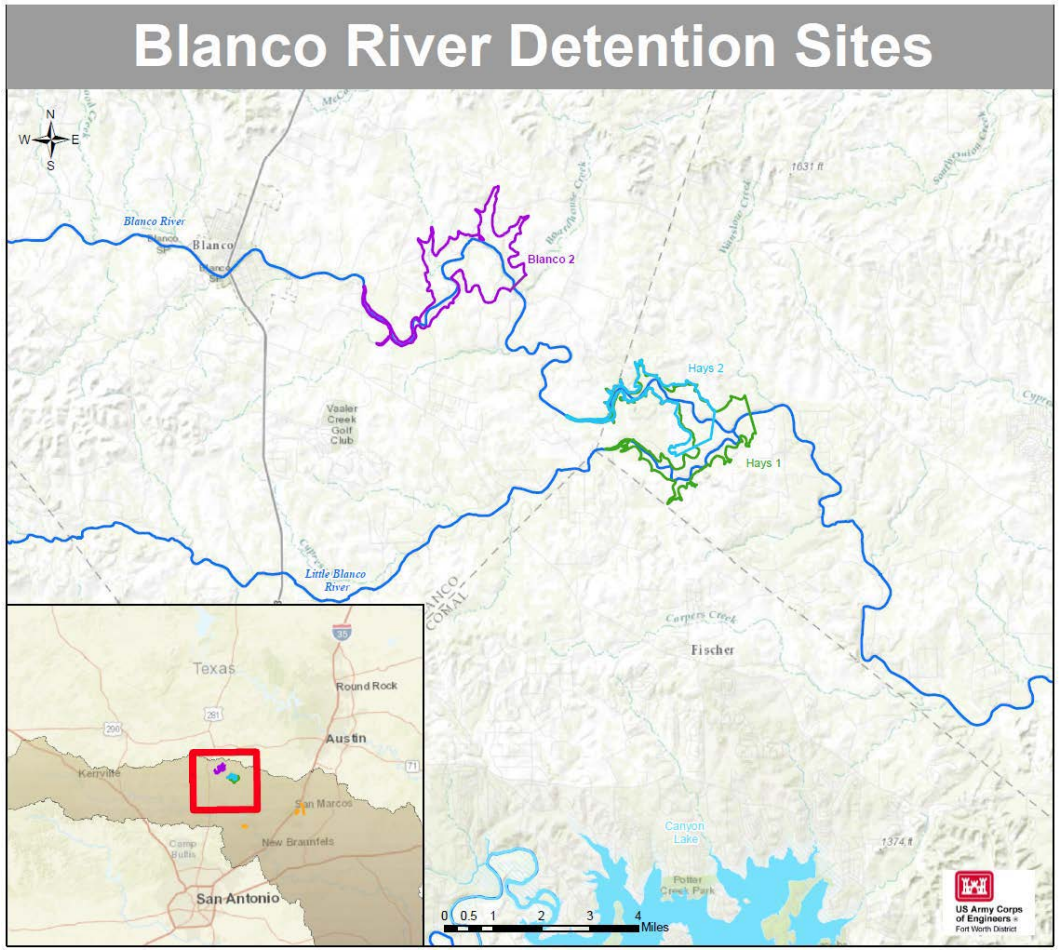




Blanco River – Long-Term Solution

Detention

- USACE evaluated Detention
  - 43,690 acre-feet of storage required
  - In Blanco County / western Hays County
  - Impacts multiple existing structures, significant ROW, displacements
  - Only provides benefits if rains upstream of pond
  - Cost: $73 million

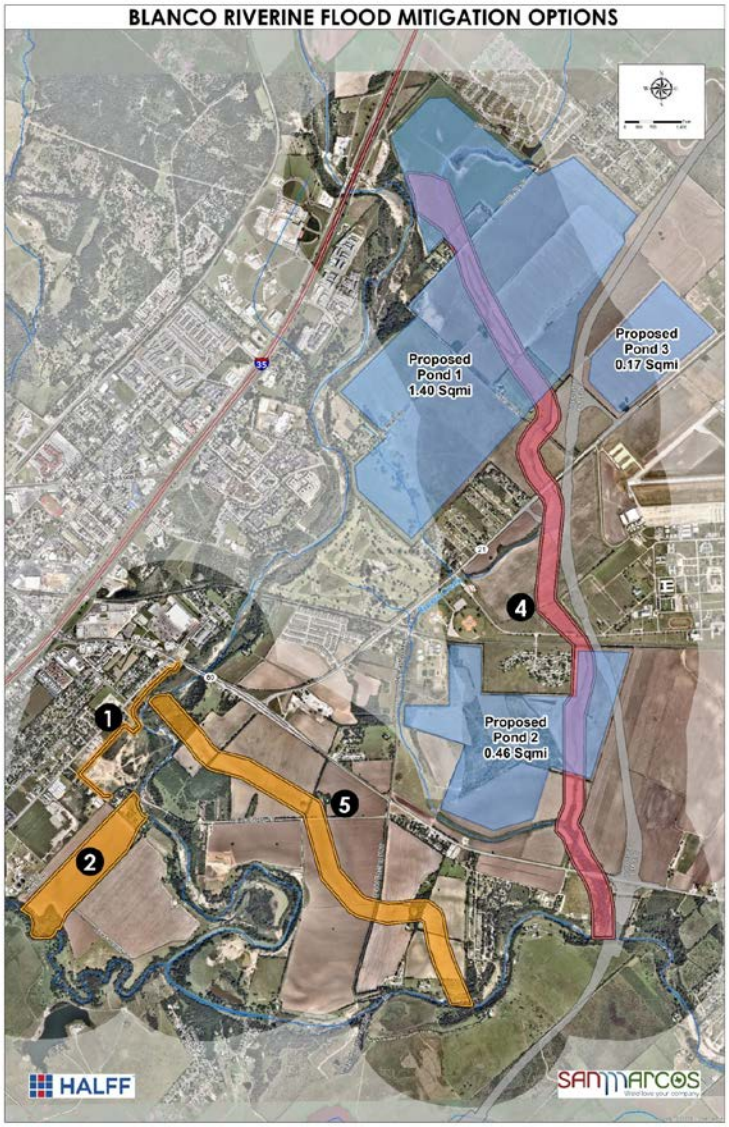


Blanco River – Long-Term Solution

Detention

- Detention near Project
  - Approximate storage required ~40,000 acre-feet
  - Approximate land/ROW required ~2 square miles at 30 feet deep (blue on map)
  - Approximate excavation at $5/cy ~ over $300 million

NOTE: Detention deemed infeasible from both a cost and land acquisition standpoint.



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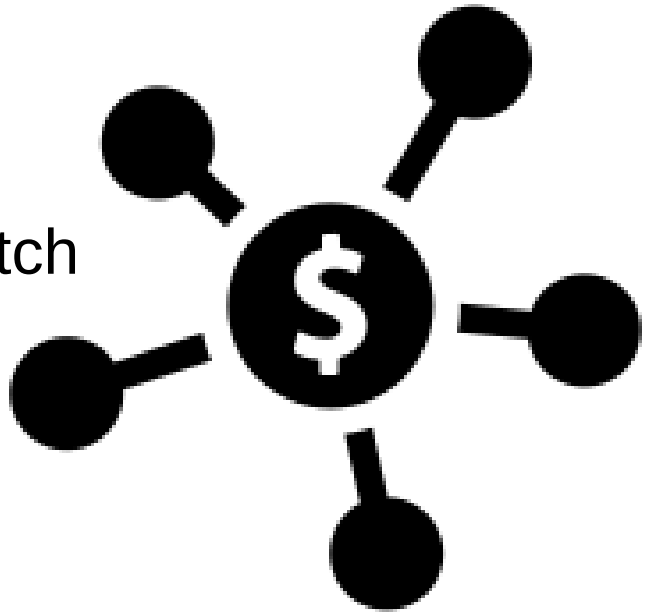
Long Term Options (Regional Mitigation)					
Berm + Diversion 2 + Full Bypass	$74M	473	836	573	$89,000

*Estimated project cost divided by the number of 100-year structures benefitted by the project.

Long Term Project Funding

- Potential TWDB = 50/50 match
- Potential FEMA Funding = 75/25 match
- Potential USACE = *
- Potential Regional Funding = TBD



* Long-term projects did not meet USACE benefit to cost ratio

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