Update from Consultant Team

Neches Regional Flood Planning Group

June 22, 2022

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Agenda

- Task 7 – Flood Response Information and Activities
- Task 4B – Identification and Evaluation of Potential FMEs, FMSs, and FMPs
- Task 5 – Recommendation of FMEs, FMSs, and FMPs

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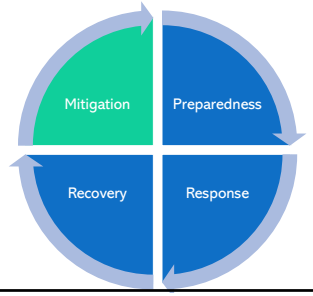
Task 7: Flood Response Information and Activities

- Task Goals:
  - Summarize nature and types of flood response preparations
- Not an analysis related to planning for disaster response or activities



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Task 7 – Relevant Entities in Region

Local
- Police Departments
- Fire Departments
- County Emergency Responders
- Drainage Districts

State
- DPS
- TWDB
- TDEM
- TxDOT
- Texas Army National Guard
- River Authorities

Federal
- FEMA
- NOAA
- USACE
- USFS
- NWS
- USGS

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Task 7 – Mitigation

- Primary focus of the Regional Flood Planning Process
- Implementation of actions, including both structural and non-structural solutions, to reduce flood risk to protect against the loss of life and property

- Examples (Structural):
  - Regional Detention
  - Storm Drain Improvements
  - Low Water Crossing/Bridge Improvements
- Examples (Non-Structural):
  - Flood Early Warning Systems
  - Floodplain property acquisition
  - Elevation of Structures above BFE

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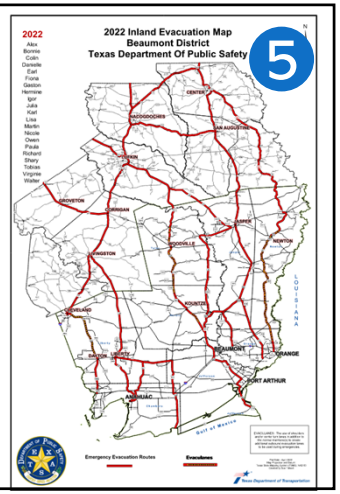
Task 7 - Preparedness

- Actions, aside from mitigation, that are taken before flood events to prepare for flood response activities
- Examples:
  - Identification of Critical Infrastructure
  - Emergency Action Plans
  - Public Notification/Education
  - Identification of Evacuation Routes
  - Tabletop exercises
  - Staff training for response/recovery



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Task 7 - Response

- Actions taken during and in the immediate aftermath of a flood event
- Examples:
  - Reverse 911 & other notifications
  - Social Media Posts/Alerts
  - Radio stations & Emergency Alert systems
  - Emergency Operation Centers
  - Forecast tools & centers
  - Closing roadways and traffic control
  - Providing high water rescues
  - Food & First Aid Distribution

Aerial photo of the Hillebrandt area of Jefferson County immediately after Hurricane Harvey, *Beaumont Enterprise*

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Task 7 - Recovery

- Actions taken after a flood event involving repairs or other actions necessary to return to pre-event conditions
- Examples:
  - Providing information on flood insurance
  - Coordinating debris removal and cleanup
  - Providing traffic control
  - Assisting residents to find temporary housing
  - Regular communication with disaster victims
  - Coordinating with local businesses
  - Compiling and conducting damage assessments

NATIONAL FLOOD INSURANCE PROGRAM

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Task 7 – Previous Flood Response Activities

Activity Description	Category	Entity	Location	Year
Flooding/ Road Closures and Signage	Response	City of Lufkin	West Frank Avenue	2021
Flooding/ Road Closures and Signage	Response	City of Lufkin	South First St (southbound)	2021
Flooding/ Road Closures and Signage	Response	City of Lufkin	Tom Holland Rd	2015
Flooding/ Road Closures and Signage	Response	City of Lufkin	S Loop 287	2015
Flooding/ Road Closures and Signage	Response	City of Nacogdoches	CR 353	2015
Flooding/ Road Closures and Signage	Response	City of Nacogdoches	Highway 7	2015
Flooding/ Road Closures and Signage	Response	City of Nacogdoches	CR 620	2015
Flooding/ Road Closures and Signage	Response	City of Nacogdoches	North Street	2021
Flooding/ Road Closures and Signage	Response	City of Lufkin	TX-103	2018
EOC Flood Response Incident Command	Response	TXDPS, TDEM, OEM	Jefferson County	2017
EOC Flood Response Incident Command	Response	TXDPS, TDEM, OEM	Hardin County	2017
EOC Flood Response Incident Command	Response	TXDPS, TDEM, OEM	Liberty County	2017
EOC Flood Response Incident Command	Response	TXDPS, TDEM, OEM	Orange County	2017
EOC Flood Response Incident Command	Response	TXDPS, TDEM, OEM	Jasper County	2017
Lumberton High School Flood Response Staging Area	Response	TXDPS, TDEM, OEM	City of Lumberton	2017

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Task 7 - Flood Response and Recovery Activities

Entity	Emergency Preparedness and Response Activities Undertaken
Beaumont	Cameras
	Coordination with TxDOT Message Boards
	Flood Gages
	Flood Warning Signs
	Public Emergency Alert System
	Public-Facing Website
	Rain/Stream Gages with Alerts
	Setting Up Barricades/Closing Gates
Bevil Oaks	Flood Gages
	Public Emergency Alert System
	Rain/Stream Gages with Alerts
Chambers County	Flood Warning Signs
	Public Emergency Alert System
	Public-Facing Website
	Setting Up Barricades/Closing Gates
City of San Augustine	Public-Facing Website
	Setting Up Barricades/Closing Gates

Entity	Emergency Preparedness and Response Activities Undertaken
Hardin County	Flood Gages
	Forecasting Tools for Floods
	Public Emergency Alert System
	Public-Facing Website
	Setting Up Barricades/Closing Gates
Henderson County	Coordination with TxDOT Message Boards
	Flood Gages
	Flood Warning Signs
	Public Emergency Alert System
	Setting Up Barricades/Closing Gates
Ivanhoe	Public Emergency Alert System
	Public-Facing Website
	Setting Up Barricades/Closing Gates
JCDD6	Cameras
	Flood Gages
Vidor	Public Emergency Alert System

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Task 7 – Hazard Mitigation Action Plans

- Reduces loss of life and property by minimizing the impact of disasters
- Identifies natural disaster risks and vulnerabilities that are common in their area
- develop long-term strategies for protecting people and property from similar events

Jurisdiction	Year
Anderson County	2018
Angelina County	2018
Chambers County	2017
Cherokee County	2020
Henderson County	2020
Jefferson County Drainage District 6	2016
Jefferson County Drainage District 7	2017
Liberty County	2017
Orange County Drainage District	2017
Polk County	2000
San Augustine County	2018
Smith County	2018
Trinity County	2019
Van Zandt County	2019

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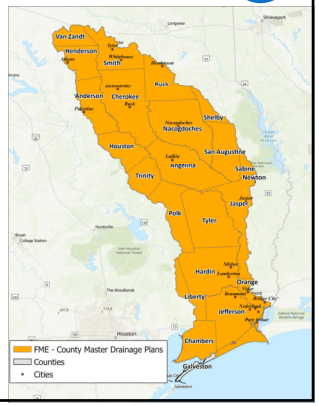
Task 4B FMEs – County Master Drainage Plans

- 21 FMEs identified
- Cost estimates range from $310,000 to $1,900,000
  - Total Cost $25,615,000
- Supporting Materials Discussion



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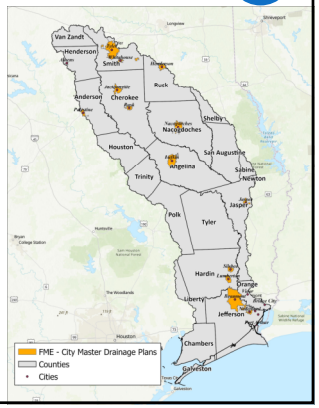
Task 4B FMEs – City Master Drainage Plans

- 16 FMEs identified
- Cost estimates range from $150,000 to $2,200,000
  - Total Cost $10,590,000
- Supporting Materials Discussion



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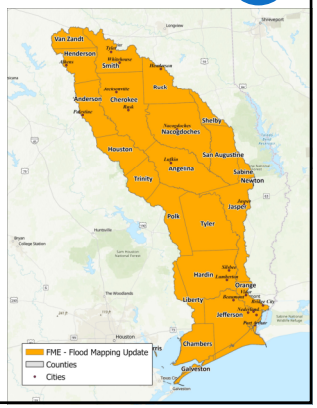
Task 4B FMEs – Flood Mapping Updates

- 22 FMEs identified
- Cost estimates range from $760,000 to $5,000,000
  - Total Cost $61,710,000
- Supporting Materials Discussion



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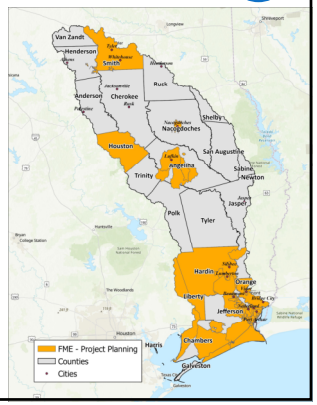
Task 4B FMEs – Project Planning

- 90 FMEs identified
- Cost estimates range from $20,000 to $200,000,000
  - Total Cost $323,632,500
- Supporting Materials Discussion



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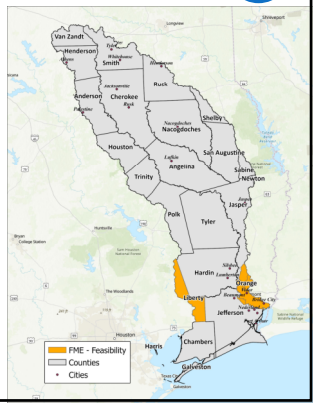
Task 4B FMEs – Feasibility Assessments

- 7 FMEs identified
- Cost estimates range from $100,000 to $325,000
  - Total Cost $1,130,000
- Supporting Materials Discussion



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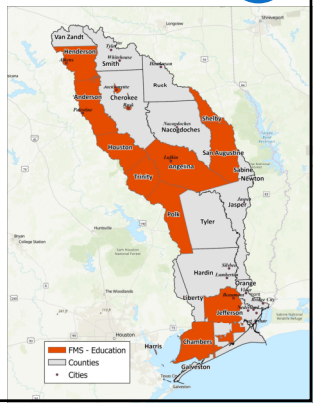
Task 4B FMSs - Education

- 24 FMSs identified
- Cost estimates range from $3,000 to $50,000
  - Total Cost $561,100
- Supporting Materials Discussion



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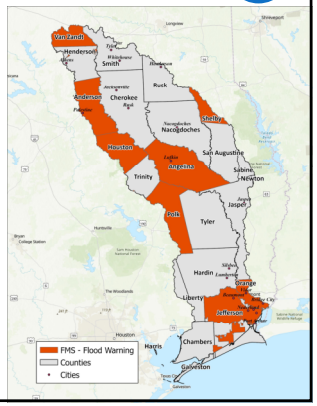
Task 4B FMSs – Flood Warning

- 17 FMSs identified
- Cost estimates range from $5,000 to $3,319,000
  - Total Cost $8,719,000
- Supporting Materials Discussion



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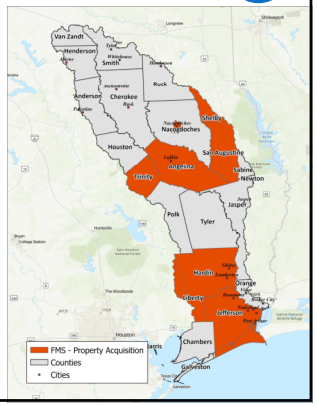
Task 4B FMSs – Property Acquisition

- 19 FMSs identified
- Cost estimates range from $40,000 to $2,140,000
  - Total Cost: $7,973,000
- Supporting Materials Discussion



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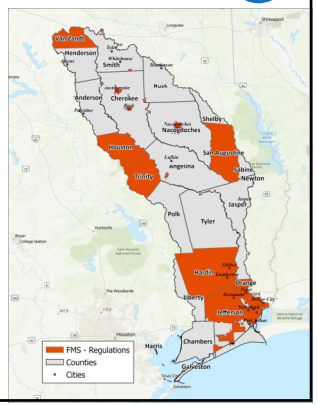
Task 4B FMSs - Regulations

- 32 FMSs identified
- Cost estimates range from $5,000 to $900,000
  - Total Cost: $1,994,600
- Supporting Materials Discussion



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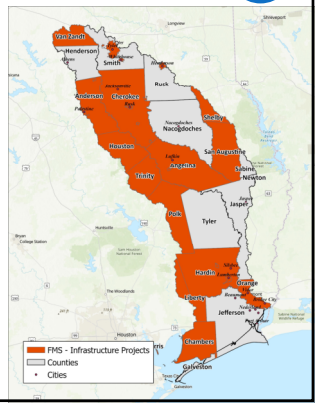
Task 4B FMSs - Infrastructure

- 53 FMSs identified
- Cost estimates range from $5,000 to $200,000
  - Total Cost: $6,540,500
- Supporting Materials Discussion



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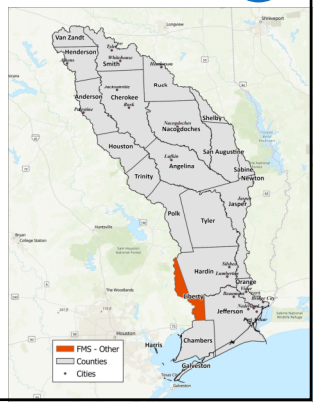
Task 4B FMSs - Other

- 2 FMSs identified
- Cost estimates range from $50,000 to $107,000
  - Total Cost: $157,000
- Supporting Materials Discussion



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Task 4B FMPs – Detention, Channel, Comprehensive

- 5 FMPs evaluated
- Cost estimates range from $4.25 M to $2.4 B for evaluated projects
- Cost estimates developed from project reports and FEMA BRIC applications
- Total cost for evaluated FMPs is $3.1 B

FMP Name	Description	Sponsor	Total Cost
Bayou Din Detention Basin	Construct a new detention basin with nearby channel and crossing improvements in the vicinity of Bayou Din.	Jefferson County Drainage District 6	$85 Million
Channel 100-A Concrete Repair	Conduct repairs and install improvements to Channel 100-A located within the city of Beaumont.	Jefferson County Drainage District 6	$39.57 Million
Port Arthur and Vicinity Coastal Storm Risk Management Project	Construct levees, floodwalls, pump stations, drainage structures, and other flood mitigation infrastructure to reduce adverse flood impact in the vicinity of the city of Port Arthur.	USACE, Gulf Coast Protection District, Jefferson County Drainage District 7	$863 Million
Orange County Coastal Storm Risk Management Project	Construct levees, floodwalls, pump stations, drainage structures, and other flood mitigation infrastructure to reduce adverse flood impact in Orange County.	USACE, Orange County Drainage District	$2.4 Billion
Bessie Heights Drainage Ditch Extension Project	Expand the Bessie Heights Drainage Ditch to address flooding risk to residential properties in the area.	Orange County Drainage District	$4.25 Million

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Bayou Din Detention Basin FMP

- Sponsor
  - Jefferson County Drainage District 6
- FMP Components:
  - Install new detention basin and conduct channel improvements near Bayou Din in Jefferson County
  - New Detention Basin
  - Channel improvements
    - Improve channel by both deepening and widening segments for upgraded capacity
- BCA Analysis
  - Total cost: $85,000,000
  - BCR = 4.9
- No negative impact anticipated from the FMP
  - Project does not violate state water code or result in impacts to others
  - **Important Note:**
    Local sponsors will be ultimately responsible for proving the final project design has no negative flood impacts.

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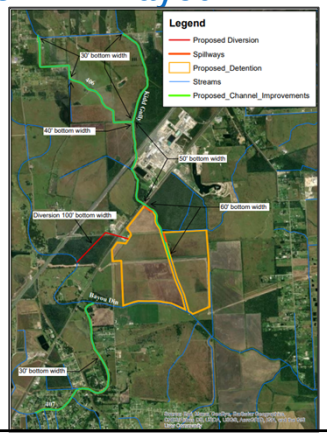
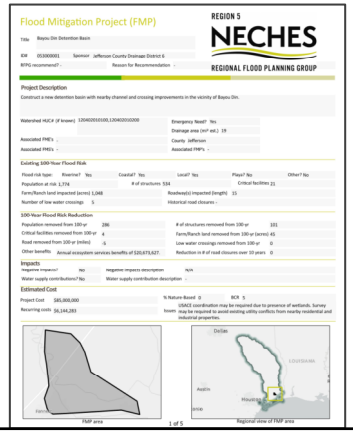
Task 4B: Bayou Din Detention Basin FMP





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Channel 100-A Concrete Repair FMP

- Sponsor
  - Jefferson County Drainage District 6
- FMP Components:
  - Widen and provide lining for the existing Channel 100-A within Beaumont, TX
  - Channel improvements
    - Improve channel by both deepening and widening segments for upgraded capacity
- BCA Analysis:
  - Total cost: $39,570,866
  - BCR = 11.21
- No negative impact anticipated from the FMP
  - Project does not violate state water code or result in impacts to others
  - **Important Note:**
    Local sponsors will be ultimately responsible for proving the final project design has no negative flood impacts.

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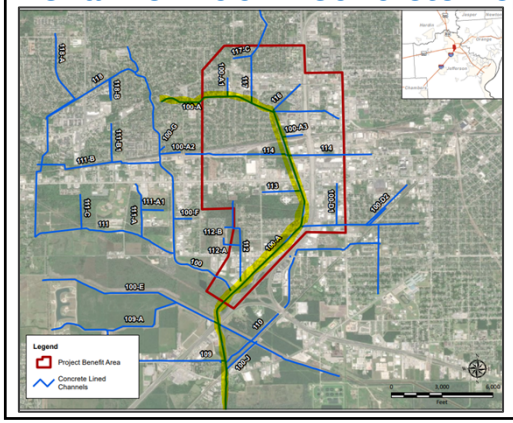
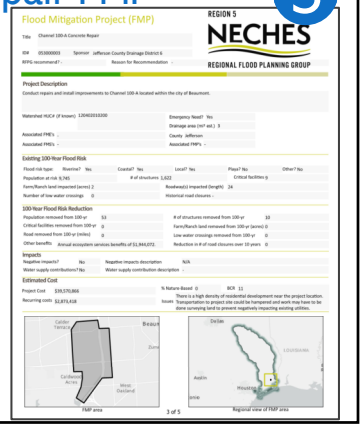
Channel 100-A Concrete Repair FMP





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Port Arthur and Vicinity Coastal Storm Risk Management Project FMP

- Sponsor
  - Jefferson County Drainage District 7
- FMP Components:
  - Reduce risk from coastal storm surge and flood damage for residents and businesses in coastal hazard areas in Jefferson County.
  - New earthen levees (5.5 miles)
  - New concrete floodwalls (5.7 miles)
  - ~26 road and railway crossing closure gates
- BCA Analysis:
  - Total cost: $863,000,000
  - BCR = 4.6
- No negative impact anticipated from the FMP
- **Important Note:**
  Local sponsors will be ultimately responsible for proving the final project design has no negative flood impacts.

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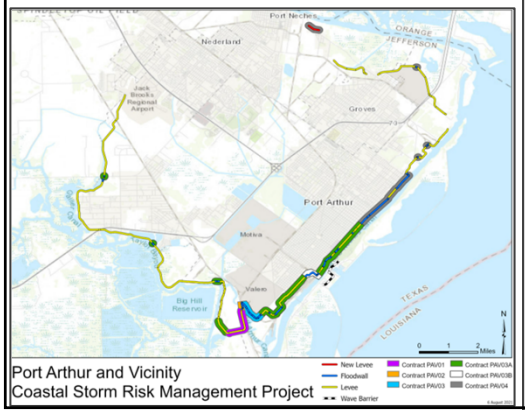
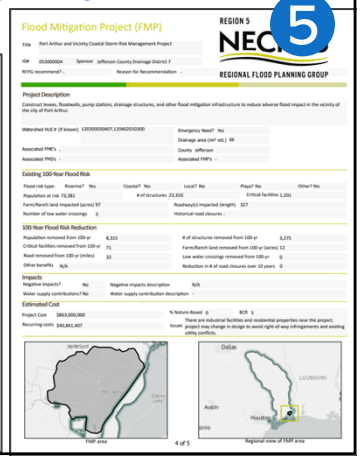
Port Arthur and Vicinity Coastal Storm Risk Management Project FMP





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Orange County Coastal Storm Risk Management Project FMP

- Sponsor
  - USACE, Orange County Drainage District
- FMP Components:
  - Provide enhanced coastal storm surge protection and flood damage risk reduction for residents and businesses in coastal hazard areas in Orange County.
  - New earthen levees (15 miles)
  - New concrete floodwalls (10 miles)
  - 50 gravity drainage structures
  - Multiple pump stations
  - ~30 road and railway crossing closure gates
  - 2 navigable sector gates at Adams and Cow Bayous
- BCA Analysis:
  - Total cost: $2,400,000,000
  - BCR = 1.2
- No negative impact anticipated from the FMP
- **Important Note:**
  Local sponsors will be ultimately responsible for proving the final project design has no negative flood impacts.

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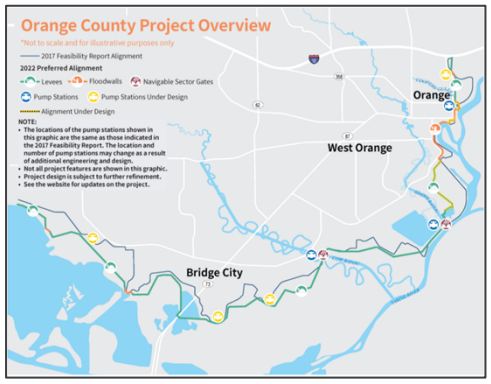
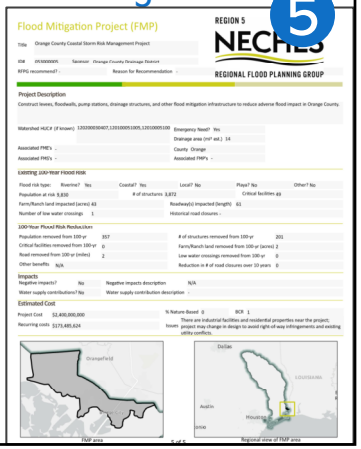
Orange County Coastal Storm Risk Management Project FMP





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Bessie Heights Drainage Ditch Extension Project FMP

- Sponsor
  - Orange County Drainage District
- FMP Components:
  - Reduce structural flooding in residential developments within the project area by improving and extending the existing Bessie Heights Drainage Ditch.
  - Channel improvements
    - Extend and conduct improvements to the existing Bessie Heights Drainage Ditch located in the vicinity of Bridge City.
- BCA Analysis:
  - Total cost: $4,250,000
  - BCR unknown
- No negative impact anticipated from the FMP
  - Project does not violate state water code or result in impacts to others
  - **Important Note:**
    Local sponsors will be ultimately responsible for proving the final project design has no negative flood impacts.

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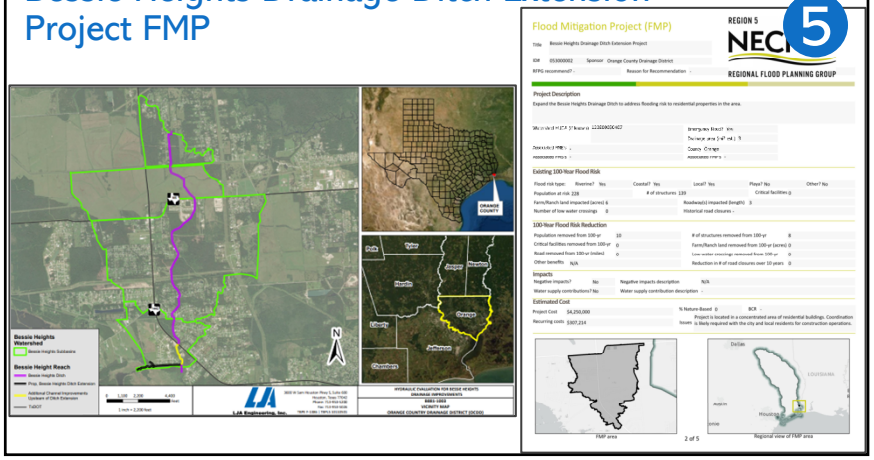
Bessie Heights Drainage Ditch Extension Project FMP



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Task 5 - Recommendation of FMEs, FMSs, FMPS

- Determine if there are any actions on the list of identified FMEs, FMSs, FMPs that the RFPG should not support
- Encourage the RFPG to favor inclusion of FMXs understand that there is no obligation to take action and no financial commitment associated with FMX sponsorship

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Task 5 - Recommendation of FMEs

FME Type	FME Description	Number of Evaluations	Total Cost
Watershed Planning	Flood Mapping Updates	22	$61,710,000
	Master Drainage Plan	37	$36,205,000
Project Planning	Feasibility Assessments	7	$1,130,000
	Project Design Development	90	$323,632,500
	Total	**156**	**$422,677,500**

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Task 5 - Recommendation of FMSs

FMS Type	Description	Number of Strategies	Total Cost
Education and Outreach	Public education programs	24	$561,100
Flood Measurement and Warning	Warning systems and gages	17	$8,719,000
Property Acquisition and Structural Elevation	Acquiring properties and creating regulation to raise future structures	19	$7,973,000
Regulatory and Guidance	NFIP participation, CRS, stormwater utility fee development	32	$1,994,600
Infrastructure Projects	Establish program, plan, or standards to facilitate future infrastructure improvements	53	$6,540,500
Other	Topographical mapping updates, County coordination	2	$157,000
	Total	**147**	**$25,945,200**

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Task 5 - Recommendation of FMPs

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FMP Type	Description	Total Cost
Channel	Channel extensions and upgrades to increase capacity of water conveyance	$43,820,866
Comprehensive	Improve existing levees, build new pump stations, construct/reconstruct floodwalls to higher elevations	$3,263,000,000
Detention	New detention pond construction	$85,000,000
	Total	**$3,391,820,866**