

DRAFT ENVIRONMENTAL ASSESSMENT

Fort Bend County Levee Improvement District No.
7 Brazos River Bank Stabilization Project

Fort Bend County, Texas

HMGP-4332-0035-TX

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FEMA

U.S. Department of Homeland Security
Federal Emergency Management Agency
Region 6
800 North Loop 288
Denton, TX 76209-3698

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	PURPOSE AND NEED	1
2.1	Purpose.....	1
2.2	Need	2
3.0	ALTERNATIVES	2
3.1	Alternative 1: No Action	2
3.2	Alternative 2: Proposed Action – Bank Reconstruction and Bendway Weirs	2
3.3	Alternatives Considered but Dismissed	3
3.3.1	Levee Relocation	3
3.3.2	Bank Slope Layback.....	3
3.3.3	River Channel Reconstruction/Relocation.....	3
4.0	AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS	4
4.1	Physical Resources.....	4
4.1.1	Geology, Soils, and Seismicity.....	4
4.1.2	Air Quality	8
4.1.3	Climate Change	9
4.2	Water Resources	9
4.2.1	Water Quality.....	10
4.2.2	Waters of the United States, Including Wetlands	10
4.2.3	Floodplains	14
4.3	Coastal Resources	16
4.4	Biological Resources	16
4.4.1	Threatened and Endangered Species and Critical Habitat	16
4.4.2	Fish and Wildlife	17
4.5	Cultural Resources.....	19
4.5.1	Archeological Resources and Historic Properties.....	19
4.5.2	American Indian Cultural/Religious Sites.....	22
4.6	Socioeconomic Resources	22
4.6.1	Population, Demographics, and Environmental Justice.....	22
4.6.2	Hazardous Material.....	25
4.6.3	Noise	26
4.6.4	Traffic	27
4.6.5	Public Services and Utilities.....	28
4.6.6	Public Health and Safety	28
4.6.7	Land Use.....	29
4.7	Summary Table.....	30
5.0	CUMULATIVE IMPACTS.....	39
6.0	RESOURCE AGENCY COORDINATION, PUBLIC INVOLVEMENT, AND PERMITS	39
6.1	Agency Coordination.....	39
6.2	Public Involvement.....	40
6.3	Permits	41
7.0	REFERENCES	41
8.0	LIST OF PREPARERS	43

LIST OF TABLES

Table 1: Soil Map Units	6
Table 2: Federal List of Endangered and Threatened Species in Fort Bend County	17
Table 3: Previous Archaeological Investigations within 1,000 m of the APE	20
Table 4: Previously-Recorded Archaeological Sites and Cemeteries within 1,000 m of the APE	20
Table 5: Population Statistics for Fort Bend County.....	23
Table 6: Population and Demographic Statistics for the County, City and Census Block Groups in the Project Vicinity	23
Table 7: Utilities	28
Table 8: Anticipated Affected Environment and Environmental Issues for the Proposed Action	31

EXHIBITS

Exhibit 1 – Regional Location Map

Exhibit 2 – Fort Bend County LID 7 Boundary

Exhibit 3 – Project Site

Exhibit 4 – Preliminary Bank Stabilization Design

Exhibit 5 – USGS Surface Geology Map

Exhibit 6 – NRCS Soil Unit Map

Exhibit 7 – Wetlands and Floodplain

Exhibit 8 – Census Tracts, Block Groups and High-Minority Areas

APPENDICES

Appendix A – Agency Coordination

LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
APE	area of potential effects
BMP	best management practice
CO ₂	carbon dioxide
CO	carbon monoxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
dBA	decibels, A-weighting scale
ESA	Endangered Species Act
EA	Environmental Assessment
EJ	environmental justice
EPA	Environmental Protection Agency
EFH	Essential Fish Habitat
EO	Executive Order
FPPA	Farmland Protection Policy Act of 1981
FEMA	Federal Emergency Management Agency
FWCA	Fish and Wildlife Coordination Act
FMC	Fishery Management Councils
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FBCLID7	Fort Bend County Levee Improvement District No. 7
GIS	geographic information system
GHG	greenhouse gas
HMGP	Hazard Mitigation Grant Program
HTC	Historic Texas Cemetery
Pb	Lead
MBTA	Migratory Bird Treaty Act
MHI	Median Household Income
m	meter(s)
MSATs	mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOAA-OCRM	NOAA Office of Ocean and Coastal Resources Management
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NO ₂	nitrogen dioxide
NAVD88	North American Vertical Datum of 1988
NOI	Notice of Intent

OTHM	Official Texas Historical Markers
OHWM	Ordinary High Water Mark
O ₃	Ozone
PM	particulate matter
PST	Petroleum Storage Tank
PHMSA	U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration
RRC	Railroad Commission of Texas
RTHL	Recorded Texas Historic Landmarks
RCRA	Resource Conservation and Recovery Act
SH	State Highway
SAL	State Antiquities Landmarks
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan
SO ₂	sulfur dioxide
TCMP	Texas Coastal Management Program
TCEQ	Texas Commission on Environmental Quality
TxDOT	Texas Department of Transportation
THC	Texas Historical Commission
TPWD	Texas Parks and Wildlife Department
TPDES	Texas Pollutant Discharge Elimination System
TWDB	Texas Water Development Board
USACE	U.S. Army Corps of Engineers
USDA-NRCS	U.S. Department of Agriculture, Natural Resources Conservation Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

The Houston metropolitan area has been affected in recent years by several excessive rainfall events that have resulted in flooding conditions in area creeks, bayous, and rivers, as well as residential neighborhoods and commercial centers. These events are known locally as the Memorial Day Flood (May 2015), the Tax Day Flood (April 2016), and most notably Hurricane Harvey in August 2017, which was accompanied by over 50 inches of rainfall in portions of southeast Texas. Similar to other rivers in the region, the Brazos River in Fort Bend County, Texas experienced flood flows that persisted for weeks following these events. Subsequent excessive rainfall within upstream portions of the Brazos River watershed in fall 2018 and spring 2019 resulted in flooding conditions in the lower portion of the Brazos River, including Fort Bend County.

Fort Bend County Levee Improvement District No. 7 (FBCLID7) is a political subdivision of the State of Texas created to construct certain levee and drainage improvements to protect residential and commercial properties from Brazos River flooding (Exhibits 1 and 2). The multiple flooding events in recent years have eroded the natural, unprotected northern bank of the Brazos River adjacent to FBCLID7's flood protection levee. In the vicinity of the State Highway (SH) 99 bridge, the river bank has eroded over 100 feet, and continues to erode with each successive flood event such that the river bank has encroached perilously close to FBCLID7's flood protection levee (Exhibit 3). A breach of the levee could result in catastrophic losses, including possible loss of life, and damage to properties in the New Territory residential community located behind the levee.

FBCLID7 applied for Federal Emergency Management Agency (FEMA) funding assistance through FEMA's Hazard Mitigation Grant Program (HMGP) for the design and implementation of bank stabilization treatment(s) along the eroding northern bank of the Brazos River in the area of FBCLID7's flood protection levee. Stabilizing the eroding bank of the river would halt the continued erosion of the bank and provide a long-term solution to protect FBCLID7's levee that safeguards New Territory properties located behind the levee.

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and FEMA's procedures for implementing NEPA (FEMA Instruction 108-1-1). FEMA is required to consider potential environmental impacts before funding or approving actions and projects.

The purpose of this EA is to analyze the potential environmental impacts of implementing bank stabilization treatment(s) along an approximately 3,650-foot section of the Brazos River in Fort Bend County (the project area) (Exhibit 3). FEMA will use the findings in this EA to determine whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact (FONSI).

2.0 PURPOSE AND NEED

2.1 Purpose

Through the HMGP, FEMA provides grants to states and local governments to implement long-term hazard mitigation measures. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

2.2 Need

The project need is to address the erosion of a section of the Brazos River adjacent to FBCLID7's flood protection levee. If allowed to persist in its current condition, continued erosion of the river bank would allow flood waters within the river to encroach toward the levee, placing residential and commercial properties located behind the levee at a greater risk of flooding. Continued bank erosion would likely jeopardize the structural integrity of FBCLID7's flood protection levee that, if breached, could result in extensive property damage and possible loss of life.

3.0 ALTERNATIVES

Five alternatives, including the No Action Alternative, were considered to address the need for the proposed project (i.e., the continued erosion and migration of a section of the Brazos River). Two alternatives are evaluated in this EA, the No Action Alternative and the Proposed Action Alternative. Three additional alternatives were initially developed and considered but were dismissed from further consideration as discussed below in Section 3.3.

3.1 Alternative 1: No Action

The No Action Alternative would leave the section of the Brazos River adjacent to FBCLID7's flood protection levee in its present condition. No improvements to the river bank would be implemented to arrest the active erosion/migration of the bank. Continued bank erosion would expose the SH 99 bridge abutment on the northern bank of the Brazos River to erosive forces during flood flows that would lead to worsened hydraulic conditions in the area of the bridge structure. These worsened hydraulic conditions would be expected to accelerate bank loss in the general vicinity of the SH 99 bridge. Absent bank stabilization improvements, the river would continue to migrate towards FBCLID7's adjacent flood protection levee, ultimately resulting in levee failure and loss of flood protection for the community. Continued bank erosion may also adversely impact the structural stability of the SH 99 bridge. The No Action Alternative would not meet the purpose and need of the proposed project and would result in an unacceptable long-term outcome for the New Territory community.

3.2 Alternative 2: Proposed Action – Bank Reconstruction and Bendway Weirs

FBCLID7 proposes to reconstruct a stable bank at or near the current river bank location. Earthen material along the existing bank would be removed to create a sloped bank that would be protected with stone riprap. Larger stone boulders would be placed along the river bank toe, with the intent being that as minor erosion occurs along the bank toe, the larger stone boulders would fall to fill in eroded areas (launching stone toe protection). The reconstructed bank would facilitate the conveyance of flood flows through the bend in the Brazos River and the SH 99 bridge structure. The improved hydraulics would reduce the scouring and erosion that would lead to accelerated bank loss. The toe of the reconstructed bank would be configured to maintain a consistent geometric curve along the bank. Placing the reconstructed toe at or near the existing bank toe would minimize work and fill within the jurisdictional waters of the Brazos River, thereby minimizing overall environmental impacts. Upslope of the bank toe, materials and techniques appropriate for stabilizing and protecting the river bank from the erosive forces of flood flows would be installed.

A series of bendway weirs, which would extend partially into the channel of the Brazos River and would be stabilized at their bases with rock riprap, are proposed to be constructed as part of the Proposed Action. The bendway weirs would assist in improving the river hydraulics in the project area. The intent of the bendway weirs would be to alter the flow characteristics in the immediate vicinity of the weir structures to capture suspended sediment and allow the sediment to settle in the area of the bendway weirs and the reconstructed bank toe. Over time, the accumulation of sediment would accrete along the northern river bank, shifting the river channel farther south, away from the adjacent flood protection levee. The

Proposed Action would optimize stabilization of the northern river bank in the available area between the bank toe and the flood protection levee while minimizing potential environmental impacts to the river. The proposed design for Alternative 2 is depicted in Exhibit 4.

3.3 Alternatives Considered but Dismissed

3.3.1 *Levee Relocation*

This alternative would not implement bank stabilization improvements along the northern bank of the Brazos River in the project area, but instead would relocate the existing flood protection levee farther away from the river bank. The bank would continue to erode and migrate with future flood events. Relocation of the flood protection levee would require extensive real estate acquisition, including residential properties and community amenities (sports and recreational facilities), and costs associated with infrastructure adjustments. Levee relocation would also require reconstruction of the SH 99 bridge abutment and bridge approach on the north side of the Brazos River to allow for the continued erosion/migration of the river bank, and to adjust the elevation of the roadway and intersecting side streets to accommodate the relocated flood protection levee.

The anticipated costs of the required real estate acquisition, infrastructure adjustments, and reconstruction of a portion of SH 99 would be expected to exceed the cost of implementing bank stabilization or other flood mitigation actions. Adverse impacts associated with this alternative would include the displacement of multiple residents/property owners in the community, and the continued exposure of the SH 99 bridge and bridge approach to flood damage, as the ongoing bank scour and erosion would persist, possibly jeopardizing the structural stability of the bridge and roadway. This alternative would not halt the river migration, which could lead to eventual encroachment onto and failure of the relocated flood protection levee. This alternative does not represent a long-term solution to the continued erosion and migration of the river bank. Therefore, this alternative was eliminated from further consideration.

3.3.2 *Bank Slope Layback*

This alternative would involve grading the existing eroded northern bank of the Brazos River in the project area by excavating the upper portion of the bank farther away from the river and adjusting the bank toe to create a uniform slope or gradient along the bank. The bank slope and toe would then be armored to preclude erosion of the reshaped bank. The location of the bank toe could be designed to completely avoid or minimize work within the jurisdictional waters of the Brazos River, which would contribute to minimizing overall environmental impacts.

This alternative was determined to be infeasible because there is insufficient area between the existing eroded top of bank and the adjacent flood protection levee to create the desired bank gradient. Additionally, the existing SH 99 bridge abutment would remain in place and would extend as a stationary object from the northern river bank. The protruding bridge abutment would create adverse hydraulic conditions that could destabilize the realigned bank toe and reshaped bank slope in the immediate vicinity of the bridge abutment, possibly jeopardizing the long-term integrity of the reshaped slope. Therefore, this alternative was eliminated from further consideration.

3.3.3 *River Channel Reconstruction/Relocation*

This alternative would entail reconstruction of the Brazos River channel through the river bend and SH 99 bridge in the project area. The intent of the channel reconstruction would be to relocate the river channel farther south from its current location. Relocating the river channel southward would create an adequate offset distance from the top of the relocated channel bank to the adjacent flood protection levee. Reconstructing and relocating the river channel would require substantial earth-moving activities and significant work within the jurisdictional waters of the Brazos River. The work would also involve logistical issues such as the temporary diversion of river flows, dewatering areas for equipment access

and operation, and accommodating occasional elevated flows during the construction period. This alternative was determined to be undesirable because of the extensive impacts it would have on the aquatic environment, and possible alteration of flow characteristics in the project area that could affect the river downstream of the project area. Therefore, this alternative was eliminated from further consideration.

4.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

4.1 Physical Resources

4.1.1 *Geology, Soils, and Seismicity*

4.1.1.1 Existing Conditions

The proposed project is located in the lower Brazos River Basin of Texas and the Gulf Coastal Plain physiographic province. The generally flat relief of the Gulf Coastal Plain is interrupted by small streams and large streams, such as Alcorn Bayou, Bullhead Bayou, and the Brazos River in the general vicinity of the project (U.S. Geological Survey [USGS] 2016). The topographic relief of the project area is dominated by the Brazos River. An extensive network of levees and ditches is present in the general area of the proposed project. The natural ground surface of the region slopes to the southeast (USGS 2016).

The lower Brazos River is a dynamic geologic feature that is characterized as a relatively shallow, unbraided, and silty channel with a number of meanders and a flat floodplain (Dey 2016). The banks of the Brazos River exhibit steep slopes on the north side (“cut bank”) and a shallower slope on the south side (AECOM 2018). The elevation of the northern bank of the river ranges from 68 to 72 feet North American Vertical Datum of 1988 (NAVD88). The bank is well-defined, steep and undercut. The elevation of the south bank of the Brazos River in the project area ranges from 35 to 39 feet NAVD88 (SAM 2019).

The bathymetry of the Brazos River channel in the project area is described as an asymmetrical, incised V-shaped channel. The deepest part of the channel ranges from 15 to 20 feet NAVD88 along the main curvature or apex of the river. The water surface elevation of the Brazos River channel (ordinary high water mark [OHWM]) within the project area is 30.14 feet NAVD88, as determined by the U.S. Army Corps of Engineers (USACE) in October 2018. The channel depth at the SH 99 bridge crossing is deeper than the depth of the channel at the apex of the meander bend farther upstream and is about -10 feet NAVD88 (AECOM 2018).

River channels are dynamic and respond to changes in flow velocity, sediment load, and the capacity of the channel. Channels that are in equilibrium are not aggrading (building), incising (cutting downward), or widening (channel migration). In the project vicinity, the lower Brazos River is unstable and is characterized as an incised, meandering, sand-bed channel with unstable banks (Dunn 2001) that meanders within the flat floodplain. Alluvial channels, such as the Brazos River, meander and constantly respond to changes in channel conditions such as flow velocity and sediment load in an effort to reach equilibrium. The lower Brazos River exhibits evidence of active Quaternary, historical, and recent channel migration (Phillips 2007a), and has formed a variety of alluvial surfaces. The alluvial surfaces apparent in the project vicinity include deposited point bars, over-bank deposits within the floodplain, cut banks, and channel shelves.

For alluvial rivers such as the Brazos River, as flow velocities increase, so does the sinuosity of the channel. At the inside of meander bends, sediment is deposited, and on the outside of the bend, where most of the system energy is dissipated, erosion occurs and the channel migrates. In the project area, the northern bank of the Brazos River is outside the meander bend, and is the area where erosion has occurred. As erosion occurs and the river meanders, there is an increase in the amount of sediment that is deposited downstream as sand bars and bank deposits, or carried in suspension until the energy of the

river is reduced and allows fine-grained silt and clay-sized particles to be deposited in the downstream direction. The erosion and sedimentation that occurs within the Brazos River system has shifted the main channel location (thalweg) within the floodplain in an attempt to reach geomorphic equilibrium (Phillips 2007b). The movement or transport of sediments of various particle sizes and the erosion that occurs in bank types present along the lower Brazos River have been studied (Phillips 2007a) in an attempt to understand the hydraulic conditions that produce stable channels.

Studies have been performed to relate specific discharge thresholds to observed geomorphic changes and channel instability of the lower Brazos River. Based on these studies, it was determined that the thresholds for mobility of channel sediments are regularly exceeded, and thresholds for channel instability are typically exceeded. These findings provide support to the understanding that the lower Brazos River is an active laterally-migrating channel (Phillips 2015). Bank erosion in the project area is especially pronounced at the apex of the outside meander bend; an almost vertical cut bank at the apex of the Brazos River meander is obvious. Farther downstream, on the south side of the Brazos River, a sand bar is being deposited (accreted). Based on studies performed along the lower Brazos River, the erosional forces in the project area may be caused by pressure-driven secondary currents (Phillips 2007a).

Channel morphology and geometry have been measured from aerial photography and the data evaluated include estimates of meander wavelength, curvature, and channel width (USGS 2009). These data can provide an estimate of the rates of various fluvial processes such as channel migration, bank erosion, point bar accretion, and channel-bar development. During initial design studies conducted by the project team, an assessment of the cross-sectional channel adjustments of the lower Brazos River in the project area, made through time, were examined using historical aerial photography and comparison to contemporary imagery. For the project area, erosion and channel migration rates appear to have occurred over a short timeframe, caused by recent extreme flood events, as documented by the studies performed.

Geology

The surface geology in the project area consists predominantly of Quaternary (Pleistocene) Age relict alluvial, deltaic, and coastal deposits that have been uplifted to form topographic terraces with modern (Holocene) Age alluvial deposits. Quaternary alluvium (Qal) is mapped along the Brazos River in the project area (Exhibit 5). These shallow sediments are composed predominantly of clays and silty clays interbedded with discontinuous layers of silts and sands (Barnes, V.E., *et al.* 1992).

The USGS identifies the Beaumont Formation as the underlying geological formation within the project area (USGS 2006). The clay, silt, and sand deposits of the Beaumont Formation date to the Pleistocene and Holocene epochs. The deposits are deep, often reaching 100 feet or greater. Typically, these deposits have low permeability but are highly plastic. Within the upper geologic section, the Beaumont Formation is the youngest, continuous coastwise terrace fronting the modern Gulf of Mexico. The Beaumont Formation consists of clay, silt, and fine sand arranged in spatial patterns that reflect the distribution of fluvial (channel, point bar, levee, and backswamp environments) and mudflat/coastal marsh conditions. The sediments of the Beaumont Formation are characterized by primarily clays and silty clays with interbedded, discontinuous layers of silts and sands that are alluvial, deltaic, and coastal in origin. Holocene Age alluvial deposits (from 8,000 years ago to present day) have been deposited as a veneer on top of older sediments along the Brazos River. The past 18,000 years (i.e., Holocene Epoch) have been characterized by erosion of the Pleistocene sediments and the deposition of alluvial sediments in the stream valleys of the region (USGS 2006).

Soils

The lower Brazos River transports soils and sediments downstream. The carrying capacity of the river is constrained by river flow velocities, the erodibility of sediments, and the sediment grain size. The soil features of the project area as mapped by the U.S. Department of Agriculture, Natural Resources

Conservation Service (USDA-NRCS) are shown on Exhibit 6 (USDA-NRCS 2014a and 2019). The USDA-NRCS provides information about soils with respect to water table depth, drainage class, farmland classification, and erosion potential. Soil associations and soil series with map unit descriptions that occur in the project area were identified using the USDA-NRCS Web Soil Survey for Fort Bend County, Texas (USDA-NRCS 2014b). Important attributes of the soil map units relevant to the proposed project include the amount of sand, silt, and clay components, prime farmland classification, physical setting, parent material, and natural drainage characteristics (USDA-NRCS 2019).

Soil types within the project area were assessed to identify soils with severe erosion potential (USDA-NRCS 2019). The degree of water erodibility is expressed as a numeric index between 1.0 (highest potential for erosion) and 0.0 (lowest potential erosion). The degree to which a soil is susceptible to water erosion ranges from "High" to "Low" (from 1.0 to 0.0, respectively). Soils that have favorable particle size, high organic matter content, or low runoff have "Low" water erosion potential. Soils that have "High" water erosion potential are those with soil attributes combined with high runoff and having low resistance to water erosion processes (USDA-NRCS 2019). The Clemville and Norwood soils exhibit water erodibility indices that range from 0.37 to 0.49 (USDA-NRCS 2019), which indicate a moderate capacity for erosion.

Of the 20 soil types that commonly occur along the banks of the lower Brazos River, 15 soil types exhibit subsoil textures of silt loam or finer and thus are more easily eroded (Phillips 2013). The soil map units depicted on Exhibit 6 are described in Table 1.

Table 1: Soil Map Units

Map Unit Symbol	Map Unit Name	Physical Setting	Parent Material	Percent			Prime Farmland	Natural Drainage Class
				Sand	Silt	Clay		
Ac	Asa-Pledger complex, 0 to 1 percent slopes, rarely flooded	Floodplains	Clayey alluvium of Holocene age	15.0	40.0	35.0	All areas are prime farmland	Well-drained
BP	Pits, borrow	Miscellaneous	--	--	--	--	--	--
Ma	Brazoria clay, 0 to 1 percent slopes, rarely flooded	Floodplains	Clayey alluvium	1.1	25.4	73.5	All areas are prime farmland	Moderately well-drained
Mb	Clemville fine sandy loam, rarely flooded	Floodplains	Loamy fluviomarine deposits	9.5	68.0	22.5	All areas are prime farmland	Well-drained
Mc	Clemville silt loam, 0 to 1 percent slopes, rarely flooded	Floodplains	Loamy fluviomarine deposits	7.0	70.0	23.0	All areas are prime farmland	Well-drained
Md	Clemville silty clay loam, 0 to 1 percent slopes, occasionally flooded	Floodplains	Loamy fluviomarine deposits	7.0	64.0	29.0	Not prime farmland	Well-drained
Nc	Norwood loam, 0 to 1 percent slopes, rarely flooded	Natural levees	Loamy alluvium over clayey alluvium over loamy alluvium	39.2	45.4	15.4	All areas are prime farmland	Well-drained

Map Unit Symbol	Map Unit Name	Physical Setting	Parent Material	Percent			Prime Farmland	Natural Drainage Class
				Sand	Silt	Clay		
Nd	Norwood silty clay loam, 0 to 1 percent slopes, rarely flooded	Natural levees	Loamy alluvium over clayey alluvium over loamy alluvium	19.0	51.0	30.0	All areas are prime farmland	Well-drained
Pa	Pledger clay, 0 to 1 percent slopes, rarely flooded	Floodplains	Quaternary age clayey alluvium	1.6	28.9	69.5	All areas are prime farmland	Moderately well-drained
Sa	Sandy alluvial land, occasionally flooded	--	Loamy sand, stratified sand to loam	82.5	9.0	8.5	Not prime farmland	Somewhat poorly drained
Sb	Sloping alluvial land, rarely flooded	--	Clay loam	35.0	30.0	35.0	Not prime farmland	Well-drained
W	Water	--	--	--	--	--	--	--

The USDA is primarily responsible for implementing federal farmland policy. Guiding farmland policy is the goal of the Farmland Protection Policy Act of 1981 (FPPA). For the purpose of implementing the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. The USDA-NRCS *National Soil Survey Handbook* defines prime farmland as land with soils that are conducive to agriculture (USDA-NRCS 2018).

According to the USDA-NRCS, the soil map units Ma and Mc are considered to be prime farmland soils (USDA-NRCS 2019). There are no unique soils identified in Texas. There are no soils of statewide importance in the project area. According to the 2010 Census - Urbanized Area Reference Map: Houston, TX (UA 40429), the proposed project area is located within an urbanized area. Lands identified as urbanized area on Census Bureau Maps are not subject to the provisions of the FPPA

Seismicity

Faulting is common in the Texas coastal zone and is a product of natural geologic processes. Coastal faults are related to the gradual subsidence and tilting of the underlying strata, and the adjustment of the overlying sediment. Most documented active faults are located in areas of heavy withdrawal of groundwater, oil, and gas. These areas have also experienced the greatest surface subsidence (Fisher *et al.* 1972). Fluid withdrawal can activate movement along faults by depressurizing subsurface sediments, which reduces buoyancy and increases the overburden pressure.

Recent studies indicate that active surface faults are strictly normal-slip faults (Campbell, M.D., *et al.* 2018). The faults trending toward the project area are normal faults since the downthrown side is trending to the south and east. Even though subsurface faults may be present in the project vicinity, the potential seismic hazard is mapped as “low.” The project area is assigned to the Class B hazard area, which is described as those areas where geologic evidence demonstrates the existence of faults or suggests Quaternary deformation, but either (1) the fault might not extend deeply enough to be a potential source of significant earthquakes or (2) the currently available geologic evidence is too strong to assign fault features to Class C, but not strong enough to assign it to Class A (USGS 2006 and Wheeler 1999).

4.1.1.2 No Action Alternative

Under the No Action Alternative, the northern bank of the Brazos River in the project area would not be stabilized. With no bank stabilization, the Brazos River would continue to erode and meander within its floodplain during extreme weather events, and likely would eventually erode into and breach FBCLID7's flood protection levee, which could result in wide-spread flooding in the New Territory community.

Additionally, the SH 99 bridge structure may become unstable, possibly requiring that the roadway be temporarily closed for repairs. Seismicity and faulting would not be affected in the short term or the long term under the No Action Alternative.

4.1.1.3 Proposed Action Alternative

Construction of the proposed project would include installation of bank stabilization measures along the meander apex of the northern Brazos River bank. Temporary construction equipment access routes and designated staging areas would be established during construction but would not be expected to affect surface topography. The proposed project would be designed to accommodate variations in conditions of topography, bathymetry, sediments and soils, geology, and faulting. The design of the proposed project would incorporate seismic standards, as applicable.

Long-term impacts of the Proposed Action Alternative would be largely beneficial, as the northern river bank would be protected from continued erosion, and the bendway weirs would be expected to capture some volume of suspended sediments within the Brazos River that otherwise would be transported downstream. The proposed bank stabilization would improve hydraulic conditions in the area of the SH 99 bridge, which would be expected to reduce river bed scour and turbulent flows at the bridge that currently contribute to the accelerated bank erosion and loss immediately downstream of the bridge. In the long term, the stabilized bank would prevent continued bank erosion and river migration in the project area and would protect FBCLID7's flood protection levee. Seismicity and faulting would not be affected in the short term or the long term under the Proposed Action Alternative.

4.1.2 Air Quality

The Clean Air Act of 1970 (as amended) establishes federal policy to protect and enhance the quality of the nation's air resources to protect human health and the environment. Regulations implementing the Clean Air Act established primary and secondary National Ambient Air Quality Standards (NAAQS) as a basis for assessing air quality. The primary NAAQS set limits to protect public health, including the health of children, the elderly, and asthmatics. The secondary NAAQS set limits to protect public welfare, which includes damages to animals, crops, vegetation, and buildings. The U.S. Environmental Protection Agency (EPA) regulates air quality in accordance with the primary and secondary NAAQS. Currently, six criteria pollutants are regulated under the NAAQS primary standards. These are carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), lead (Pb), particulate matter (PM), and sulfur dioxide (SO₂). PM standards are further separated into a standard for PM₁₀, regulating particulate matter smaller than 10 microns in diameter, and PM_{2.5}, regulating particulate matter smaller than 2.5 microns in diameter. Of these pollutants, vehicular sources contribute significantly to emissions of CO and PM, along with nitrogen oxides, hydrocarbons, air toxics, and carbon dioxide (CO₂).

The EPA has designated specific areas as either in attainment or nonattainment for the NAAQS. Nonattainment areas do not meet an air quality standard. Fort Bend County is part of the Houston-Galveston-Brazoria nonattainment area for O₃. This area is classified as a marginal nonattainment area for the 2015 O₃ standard and serious nonattainment area for the 2008 8-hour O₃ standard.

In addition to the NAAQS, the EPA regulates mobile source air toxics (MSATs). MSATs are compounds, such as benzene and other hydrocarbons, emitted from highway vehicles and non-road mobile source engines (e.g., heavy construction equipment, trains, or ships) that are known or suspected to cause cancer and other serious health and environmental effects. The Clean Air Act identified 187 air toxics labeled as hazardous air pollutants, of which the EPA identified a group of 21 MSATs, and further identified a subset of nine priority MSATs. These priority MSATs are acrolein, benzene, 1,3-butadiene, acetaldehyde, ethylbenzene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. No federal ambient standards currently exist for MSATs.

4.1.2.1 No Action Alternative

The No Action Alternative would have no effect on air quality.

4.1.2.2 Proposed Action Alternative

During construction of the proposed project, diesel-powered equipment and vehicles would be used for earth-moving and other construction activities. These activities would have a temporary impact on local air quality in the project area from PM (dust) emissions, construction equipment engine emissions, and on- and off-road MSAT emissions. Potential impacts to air quality would be minimized through the use of best management practice (BMP) dust control techniques such as covering of transported material, and watering of the construction area and haul routes to control dust emissions. In addition, the construction contractor(s) would limit idling of construction equipment during periods when the equipment is inactive, and properly maintain construction equipment in accordance with the manufacturer's specifications. The potential impacts of MSAT emissions would be minimized through compliance with the Texas low emission diesel fuel standards.

No air emissions would be generated from the stabilized river bank or bendway weir structures. Therefore, completion of the proposed project would not cause long-term impacts to air quality associated with the proposed project.

4.1.3 *Climate Change*

Fort Bend County has a subtropical, humid climate. The average annual summer temperature is 84 degrees Fahrenheit (84°F), with annual precipitation averaging 49 inches per year. Predominant winds are out of the southeast and south from the Gulf of Mexico. In January, polar air and prevailing northerly winds can usher in occasional cooler weather; however, winters are normally mild as the nearby Gulf of Mexico moderates temperatures. The proximity to the Gulf of Mexico also accounts for abundant rainfall for the area, with the exception of occasional extended dry periods (droughts). The location of the project area makes it susceptible to tropical storms and hurricanes, which can bring heavy rainfall and occasional flooding events.

4.1.3.1 No Action Alternative

The No Action Alternative would have no effect on climate change.

4.1.3.2 Proposed Action Alternative

Potential climate change effects from the proposed project are evaluated through a qualitative analysis of greenhouse gas (GHG) emissions. GHG impacts would be due to direct emissions from construction equipment and vehicles operated during construction of the proposed project. Construction emission sources would include non-road equipment used during construction, and on-road vehicles, including worker trips and trucks delivering materials to be used for project construction. The total construction period of the proposed project is expected to be approximately 12 months; therefore, total annual GHG emissions from construction equipment and vehicles would be expected to be minimal when compared to total GHG emissions within the State of Texas. Once constructed, the proposed project would not be a generator of air emissions. No significant short-term or long-term climate change impacts would be expected from construction of the proposed project.

4.2 **Water Resources**

Water resources, such as lakes, rivers, streams, canals, and drainage ditches, make up the surface hydrology of a given watershed. Federal statutes, Executive Orders (EOs), and other regulations and directives protect water quality and the beneficial uses of water resources. EO 11988 (Floodplain Management) and EO 11990 (Protection of Wetlands) mandate the control of activities that indirectly influence water quality.

4.2.1 *Water Quality*

The Clean Water Act (CWA), as amended, is the primary federal law in the United States regulating water pollution (Public Law 92-500, 33 U.S. Code §1251). The CWA regulates the quality of water discharged into “waters of the United States.” Both wetlands and “dry washes” (channels that carry intermittent or seasonal flow) are considered “waters of the United States.” Administered by the EPA, the CWA protects and restores water quality using both water quality standards and technology-based effluent limitation. The EPA publishes surface water quality standards and toxic pollutant criteria in 40 CFR, Part 131.

The Brazos River in the project area has been determined by the Texas Commission on Environmental Quality (TCEQ) to not be an impaired water or a tidally-influenced water. However, the Brazos River is a navigable water, and would be regulated as a Section 10 water under the Rivers and Harbors Act of 1899. No commercial navigation of the Brazos River is known to occur in the project area.

4.2.1.1 No Action Alternative

Under the No Action Alternative, no impacts to the Brazos River or other surface water resources in the project area would occur. The No Action Alternative would be expected to result in the continued erosion and migration of the Brazos River in the project area.

4.2.1.2 Proposed Action Alternative

Surface water may be temporarily impacted during construction of the proposed project by the introduction of minor amounts of sediment and erosion materials during rainfall events or as construction activities disturb areas of open water. Disturbances from such construction activities would be minimized to the extent practicable. Waters affected by sediment disturbances would be expected to quickly return to normal conditions.

The Texas Pollutant Discharge Elimination System (TPDES) program implements the National Pollutant Discharge Elimination System program. The TCEQ administers storm water permits for construction projects disturbing at least one acre of land, thereby requiring the preparation of a Storm Water Pollution Prevention Plan (SWPPP) prior to the commencement of proposed construction activities. In addition, because the proposed project would disturb more than five acres, a Notice of Intent (NOI) for coverage under the TPDES Construction General Permit (CGP) would also be required. FBCLID7 and the construction contractor would apply for coverage as owner and operator, respectively, under the CGP. Preparation of the SWPPP and implementation of BMPs would minimize the introduction of pollutants (primarily sediment) in storm water runoff from entering waters of the United States, namely the Brazos River. Once construction has been completed, a Notice of Termination would be filed per permit requirements.

FBCLID7 applied for and received a Department of the Army permit (Permit Number SWG-2018-0806) that authorized proposed project activities through Nationwide Permits 13, Bank Stabilization, and 45, Repair of Uplands Damaged by Discrete Events. FBCLID7 will comply with the conditions required by the nationwide permit program, including those relating to water quality. Due to the construction footprint being confined primarily to the northern river bank, the proposed project would have the potential for limited short-term impacts on surface water quality. The long-term impacts would be largely beneficial, as the river bank would be protected from continued erosion and the bendway weirs would be expected to capture some volume of suspended sediments within the Brazos River that otherwise would be transported downstream.

4.2.2 *Waters of the United States, Including Wetlands*

The USACE regulates the discharge of dredged or fill material into waters of the United States, including wetlands, pursuant to Section 404 of the CWA. The USACE also regulates work or structures in

navigable waters of the United States pursuant to Section 10 of the Rivers and Harbors Act of 1899. Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

EO 11990, Protection of Wetlands, directs federal agencies "...to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands..." for federally-funded projects. FEMA regulations for compliance with EO 11990 are found at 44 CFR Part 9, Floodplain Management and Protection of Wetlands. In compliance with FEMA regulations implementing EO 11990, FEMA is required to apply the eight-step decision-making process for actions that would impact wetlands. The eight-step process is applied to the proposed bank stabilization within the section of the Brazos River located in the project area. The following are the eight steps in the decision-making process.

Step 1 – Project Location in Floodplain/Wetland

The proposed project would involve the construction of bank stabilization improvements along the northern bank of the Brazos River upstream and downstream of the SH 99 bridge (i.e., the project area). The purpose of the proposed bank stabilization would be to prevent bank erosion and river migration from future flooding events, which would protect FBCLID7's flood protection levee from possible failure and breaching resulting from river migration into the flood protection levee. The bank stabilization would also protect the SH 99 bridge structure from possible destabilization due to continued erosion in the area of the northern bridge abutment. Construction of the proposed project would occur within the FEMA-mapped regulatory floodway of the Brazos River.

U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping identifies four wetland features within the project area (Exhibit 7). These features are the riverine system of the Brazos River, a riverine lower perennial unconsolidated bottom permanently flooded (R2UBH) water course, and three palustrine forested broad-leaved deciduous temporarily flooded (PFO1A) wetlands, two of which are mapped in the western portion of the project area and one small area mapped in the eastern portion of the project area.

The OHWM of the Brazos River in the project area was delineated in August 2018. An approved jurisdictional determination issued by the USACE in October 2018 verified the OHWM elevation as 30.14 feet, NAVD88. An identification and delineation of waters of the United States, including wetlands, was conducted for the approximate 47-acre project area that extends from the OHWM along the northern bank of the Brazos River to FBCLID7's flood protection levee. Field investigations were proposed to be conducted in 2019 but were delayed because of elevated flow events in the Brazos River that persisted for several weeks. The field investigations were resumed when river flows returned to more normal conditions. The field investigations were completed in January 2020. Identified waters of the United States, which included the OHWM of the Brazos River and two wetlands along the upper river bank, were considered during the design of the proposed bank stabilization improvements. The project design plans avoided the two identified jurisdictional wetlands along the upper river bank such that there would be no temporary or permanent impacts to these wetlands. However, the jurisdictional waters of the Brazos River would be unavoidably impacted by the proposed project.

Step 2 – Encourage Public Involvement

FBCLID7 has conducted public and community outreach relative to flood hazards and potential mitigation measures for the section of the Brazos River adjacent to FBCLID7's southern boundary. Meetings were held on March 1, 2018; April 5, 2018; April 24, 2018; and May 15, 2018. A preliminary conceptual design to stabilize the northern bank of the river in the area of the SH 99 bridge was presented for review and discussion. Public comments and input were solicited on the conceptual design. The

comments and input received were reviewed and incorporated into the project design. As part of public involvement for the project, a public notice would be published in newspapers circulated in the region, informing the public of the intent to implement proposed bank stabilization measures along the section of the Brazos River in the project area.

Step 3 – Evaluate Alternatives

Five project alternatives, including the No Action Alternative, were evaluated during initial project planning. Three alternatives were eliminated from further consideration because of being infeasible to implement, too costly, or exceedingly damaging to the aquatic environment. The alternative selected for detailed evaluation and implementation (the Proposed Action Alternative) would necessarily require construction adjacent to and partially within the jurisdictional waters of the Brazos River. However, project plans were adjusted such that construction activities would avoid two jurisdictional wetlands identified along the upper northern bank of the river in the project area. No practicable alternative outside the jurisdictional waters of the Brazos River in the project area is available that would provide adequate and effective stabilization of the northern river bank needed to protect FBCLID7's flood protection levee and the SH 99 bridge structure. The proposed project, therefore, would be considered a functionally dependent use.

Step 4 – Assess Impacts

Per 44 CFR § 9.10, FEMA must consider the potential direct and indirect adverse impacts associated with modification of wetlands, and the potential direct and indirect support of wetland development that could result from the proposed action. The proposed project would have a direct adverse effect on a relatively small area of jurisdictional waters within the project construction footprint that would be filled or modified because of project implementation. However, stabilization of the northern bank of the Brazos River in the project area would not indirectly support the modification of or subsequent development within wetlands located outside the project area. The two identified wetlands along the upper river bank in the project area would be avoided, thus no compensatory mitigation is required to construct the proposed project.

Per 44 CFR § 9.10, FEMA must consider water resource values; living resource values; cultural resource values; agricultural, aquacultural, and forestry resource values; and the proposed action's effects on the survival and quality of wetlands. Stabilizing the northern bank of the Brazos River in the project area would not be expected to contribute to water quality degradation, as the stabilized bank would eliminate the losses of earthen material that would otherwise be eroded from the bank and transported downstream in the river channel. The existing eroded river bank offers marginal habitat quality for aquatic and terrestrial wildlife. Stabilizing the bank with rock riprap or similar material on a regraded slope may provide slightly improved habitat quality, and possibly facilitate terrestrial wildlife travel along this section of the river bank. Rock riprap or similar material placed within the open waters of the Brazos River may also provide slightly improved habitat quality, as vertebrate and invertebrate aquatic species may use the interstitial spaces within the riprap for shelter and feeding. Based on investigations conducted to date, no archeological or historical resources sites have been identified in the project area. The project area would be actively monitored during construction for deeply buried archaeological materials and evidence previous cultural activity. No active agricultural, aquacultural, or silvicultural activities occur in the project area; therefore, these resources would not be adversely affected by the proposed project. The proposed project would likely benefit the survival and quality wetlands that may be present adjacent to or beyond the river bank, as stabilizing the bank would halt continued erosion that could partially or completely erode away any such wetlands that might be present.

Step 5 – Minimize Impacts

Guidelines promulgated under Section 404(b)(1) of the CWA indicate that proposed actions that would have adverse impacts on aquatic resources should be reviewed to determine if other practicable

alternatives are available that would have lesser impacts on aquatic resources. Mitigation requirements generally follow the sequence of avoiding aquatic resource impacts, minimizing the severity of the impacts, and compensating for impacts after avoidance and minimization measures have been applied. During the initial planning of the proposed project, FBCLID7 considered the presence of aquatic resources in the project area and developed a design concept that would avoid aquatic resource impacts to the extent practicable. However, because the proposed project would involve bank stabilization and the installation of bendway weirs that would necessarily require work within the Brazos River, overall design impacts were reduced to the minimum needed to construct the proposed project.

According to the regulations for Compensatory Mitigation for Losses of Aquatic Resources, issued jointly in 2008 by the USACE and the EPA, the mechanism for compensatory mitigation, listed in order of preference, is the purchase of credits from an approved mitigation bank, participation in an in-lieu fee program, and permittee-responsible mitigation. Two jurisdictional wetlands identified in the project area would be avoided; therefore, no compensatory mitigation would be required for adverse impacts to these two aquatic resources. The Department of the Army permit authorizing FBCLID7's proposed bank stabilization project was issued without the need for compensatory mitigation.

BMPs would be implemented to reduce and minimize potential impacts to aquatic resources during construction. Implementation of these measures would be a requirement of the EA's FONSI. Construction of the proposed bank stabilization measures would not be expected to result in the encouragement of further development that would modify or adversely impact wetland resources in the general vicinity of the proposed project.

FBCLID7 would comply with applicable local, state, and federal laws, regulations and requirements and obtain and comply with required permits and approvals prior to initiating work on the proposed project. No staging of equipment or initiation of onsite construction activities would begin until all required permits are obtained.

Step 6 – Determine Practicability

The proposed project would be designed to minimize or avoid direct impacts to jurisdictional waters of the United States, including wetlands, identified within the project area. The proposed bank stabilization would necessarily require that construction activities occur within and adjacent to the Brazos River. The intent of the proposed project would be to stabilize the river bank to prevent continued bank erosion and river migration that could jeopardize the structural integrity of FBCLID7's flood protection levee and the SH 99 bridge structure. Because there is no practicable alternative to effectively stabilizing the bank without affecting the waters of the Brazos River, the proposed project would be considered a functionally dependent use.

The Proposed Action Alternative would not disrupt or degrade the functions and services provided by wetlands situated outside the project area, as construction of the proposed project would be limited to the proposed project footprint. The quality of wetlands outside the project area would remain unchanged, and the proposed project would not be expected to promote development activities that could impact wetlands outside the project area. Therefore, it would be practicable to construct the proposed project within the identified jurisdictional waters of the Brazos River.

The No Action Alternative would not be a viable option, as the continued erosion of the river bank would place the New Territory community at risk of flooding should FBCLID7's flood protection levee be breached because of the migrating river.

Step 7 – Provide Public Explanation

Step 7 requires that the public be provided with an explanation of any final decision that the work in wetland is the only practicable alternative. Final public notice will be incorporated into the notice of availability for public review of the draft Environmental Assessment in accordance with 44 CFR § 9.12.

Step 8 – Comply with Executive Orders

The proposed river bank stabilization project would be constructed to be in accordance with EO 11990, to comply with USACE permit conditions, to minimize wetland modifications, to not promote the direct or indirect development of wetlands, and to adhere to the grant conditions issued by FEMA in reliance on this EA for the project funding decision.

4.2.3 Floodplains

EO 11988, Floodplain Management, requires federal agencies to “...take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains...” when conducting federal activities. FEMA regulations for compliance with EO 11988 are found at 44 CFR Part 9, Floodplain Management and Protection of Wetlands. In compliance with FEMA regulations implementing EO 11988, FEMA is required to apply the eight-step decision-making process for actions that would impact floodplains. The eight-step process is applied to the proposed bank stabilization within the section of the Brazos River located in the project area. The following are the eight steps in the decision-making process.

Step 1 – Project Location in Floodplain/Wetland

The proposed project would involve the construction of bank stabilization improvements along the northern bank of the Brazos River upstream and downstream of the SH 99 bridge (i.e., the project area). The purpose of the proposed bank stabilization would be to prevent bank erosion and river migration from future flooding events, which would protect FBCLID7’s flood protection levee from possible failure and breaching resulting from river migration into the flood protection levee. The bank stabilization would also protect the SH 99 bridge structure from possible destabilization due to continued erosion in the area of the northern bridge abutment.

As mapped by FEMA on Flood Insurance Rate Map (FIRM) Panel No. 48157C0260L, effective 4/2/2014, the project area is situated in the regulatory floodway of the Brazos River (Exhibit 7). The base flood elevation is shown as being 78 feet NAVD88. The regulatory floodway in the project area extends northward to FBCLID7’s flood protection levee. FEMA maps the area north of the levee as being an area with reduced risk of flooding due to the flood protection levee.

Step 2 – Encourage Public Involvement

FBCLID7 has conducted public and community outreach relative to flood hazards and potential mitigation measures for a section of the Brazos River adjacent to FBCLID7’s southern boundary. The meetings were held on March 1, 2018; April 5, 2018; April 24, 2018; and May 15, 2018. A preliminary conceptual design to stabilize the northern bank of the river in the area of the SH 99 bridge was presented for review and discussion. Public comments and input were solicited and were reviewed and considered during the development of the conceptual design.

Step 3 – Evaluate Alternatives

Five project alternatives, including the No Action Alternative, were evaluated during initial project planning. Three alternatives were eliminated from further consideration because of being infeasible to implement, too costly, or exceedingly damaging to the aquatic environment. The alternative selected for detailed evaluation and implementation (the Proposed Action Alternative) would necessarily require construction within the regulatory floodway of the Brazos River. No practicable alternative is available outside of the mapped regulatory floodway that would adequately and effectively stabilize the northern bank of the Brazos River in the project area to protect FBCLID7’s flood protection levee and the SH 99 bridge structure.

The proposed bank stabilization project must take place in the regulatory floodway/floodplain of the Brazos River; therefore, the project would be considered a functionally dependent use.

Step 4 – Access Impacts

Per 44 CFR § 9.10, FEMA must consider the potential direct and indirect adverse impacts associated with modification of floodplains, and the potential direct and indirect support of floodplain development that could result from the proposed action. Based on hydraulic modeling conducted for the proposed project, there would be no change in the water surface elevation upstream or downstream of the project area following construction of the bank stabilization measures and installation of the bendway weirs.

Therefore, the proposed project would not have a direct or indirect adverse effect on floodplains in the general vicinity of the project area. Additionally, implementation of the proposed project would not promote or indirectly support the occupancy or modification of floodplains. In general, most all of the land available to be developed within the New Territory community has already been developed, primarily for residential and commercial uses.

Construction of the proposed bank stabilization measures would decrease the risk of bank erosion and channel migration as a result of future flooding in the Brazos River. The proposed project would not impede or adversely redirect flood flows that could adversely affect existing floodplains. The proposed project would protect FBCLID7's flood protection levee and would not increase the flood hazard potential in upstream and downstream areas of the Brazos River or the New Territory community.

Step 5 – Minimize Impacts

The proposed project would be designed to not affect the water surface elevation of the Brazos River in the general vicinity of the project. BMPs would be implemented to allow for the conveyance of flood waters during construction to reduce the potential for floodplain alteration during the construction period. When completed, the proposed project would not be expected to result in increased flood hazard risks to properties or structures upstream or downstream of the project area, nor would the proposed project encourage further development in the floodplain.

FBCLID7 would continue to coordinate with the City of Sugar Land floodplain administrator regarding the proposed project. The project would be designed to be in compliance with local floodplain ordinances and guidelines. The applicant must coordinate with the local floodplain administrator and obtain required permits prior to initiating work, including any necessary certifications that encroachments within the adopted regulatory floodway would not result in any increase in flood levels within the community during the occurrence of the base flood discharge. The applicant must comply with any conditions of permit and all coordination pertaining to these activities should be retained as part of the project file in accordance with the respective grant program instructions.

Step 6 – Determine Practicability

As discussed above, the proposed project would be considered a functionally dependent use, as there is no practicable alternative to stabilize the northern bank of the Brazos River in the project area without conducting construction activities within the regulatory floodway. The intent of the proposed project would be to stabilize the river bank to prevent continued bank erosion and potential flood damage to the SH 99 bridge structure.

The proposed project would not affect existing flood hazards because the project would not impede or redirect flood flows. Surface water elevations would be unchanged upstream and downstream of the project area; therefore, it would be practicable to construct the proposed project within the regulatory floodway. The No Action Alternative would not be a viable option, as the continued erosion of the river bank would place the New Territory community at risk of flooding should FBCLID7's flood protection levee be breached because of the migrating river.

Step 7 – Provide Public Explanation

Step 7 requires that the public be provided with an explanation of any final decision that the floodplain is the only practicable alternative. Final floodplain public notice will be incorporated into the notice of

Step 8 – Comply with Executive Orders

The proposed river bank stabilization project would be constructed to be in accordance with EO 11988, to comply with applicable floodplain regulations and guidelines, to minimize floodplain modifications, to not promote the direct or indirect occupancy or modification of floodplains, and to adhere to the grant conditions issued by FEMA in reliance on this EA for the project funding decision.

4.3 Coastal Resources

The Coastal Zone Management Act (CZMA) of 1972 was established to provide management of the nation's coastal resources, and balance economic development with environmental conservation. The CZMA is administered through the National Oceanic and Atmospheric Administration (NOAA) Office of Ocean and Coastal Resources Management (OCRM). The overall CZMA program objectives are to "...preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." The Texas Land Commissioner chairs a public/private council called the Coastal Coordination Advisory Council. This council manages the Texas Coastal Management Program (TCMP), which is in place to ensure the long-term environmental and economic health of the Texas coast through the management of the state's coastal natural resource areas.

The project area is not located within the TCMP coastal boundary, and therefore would not be subject to the criteria set forth by the TCMP and CZMA.

4.3.1.1 No Action Alternative

Under the No Action Alternative, no impacts to coastal resources would occur.

4.3.1.2 Proposed Action Alternative

The Proposed Action Alternative is not located within the TCMP coastal boundary; therefore, there would be no short-term or long-term impacts to the state's coastal resources.

4.4 Biological Resources

Biological resources are animals and plants that inhabit an area, including threatened or endangered species, and the habitats supporting these resources. In general, biological resources include native and introduced plants that comprise the various habitats, animals present in such habitats, and natural features that support these plant and wildlife populations. The Endangered Species Act (ESA) (16 U.S. Code §1531) requires federal agencies to conserve sensitive species by listing endangered and threatened species of plants and animals and designating critical habitat.

4.4.1 *Threatened and Endangered Species and Critical Habitat***4.4.1.1 Federal Regulations**

The project area was evaluated for the potential occurrence of federally listed threatened and endangered species. Section 7 of the ESA prohibits the taking of listed threatened and endangered species unless specifically authorized by permit from the USFWS or the National Marine Fisheries Service. As defined by the USFWS, "An 'endangered' species is one that is in danger of extinction throughout all or a significant portion of its range. A 'threatened' species is one that is likely to become endangered in the foreseeable future." The ESA requires any federal agency that funds, authorizes, or carries out an action to ensure that the action is not likely to jeopardize the continued existence of any endangered or threatened species (including plant species) or result in the destruction or adverse modification of designated critical habitats.

According to the USFWS Endangered Species Program website (USFWS 2021), species listed on the Federal List of Endangered and Threatened Species that are known to occur or are believed to occur in Fort Bend County are presented in Table 2. The project area was reviewed to assess whether habitat suitable for supporting the listed species is present.

Table 2: Federal List of Endangered and Threatened Species in Fort Bend County

Common Name	Scientific Name	Status	Desirable Habitat	Suitable Habitat in Project Area
Birds				
Piping Plover	Charadrius melodus	Threatened	Wide, flat, open, sandy beaches with very little grass or other vegetation, nesting territories often include small creeks or wetlands	Yes
Red Knot	Calidris canutus rufa	Threatened	Intertidal, marine habitats near coastal inlets, estuaries, and bays	No
Whooping Crane	Grus americana	Endangered	Shallow grassy wetlands interspersed with grasslands or scattered evergreens	No
Plants				
Texas Prairie Dawn-Flower	Hymenoxys texana	Endangered	Barren stretches of saline sandy soil at the base of mima mounds	No

Source: USFWS Information for Planning and Consultation 2021

The proposed project area does not contain suitable habitat for federally listed threatened or endangered species potentially occurring in Fort Bend County except for the Piping Plover. The unvegetated point bar along the southern bank of the Brazos River in the project area may provide temporary habitat for migrating Piping Plover. However, use of this point bar area would likely only be transitory. According to the USFWS, potential effects to the Piping Plover in Fort Bend County would be a consideration solely for wind-power/wind-generation projects. As the proposed bank stabilization improvement project is not wind-related, no effects to the Piping Plover would be anticipated.

4.4.1.2 No Action Alternative

The No Action Alternative would not affect the listed threatened or endangered species.

4.4.1.3 Proposed Action Alternative

The Proposed Action Alternative may affect individual mussels that may be present in the waters of the Brazos River along the northern bank as the river bank toe is reconfigured and the bendway weirs and stabilizing riprap are placed in limited areas of the river bottom. Although there may be adverse effects to some mussels in the short term during project construction, the long-term effects would be expected to be beneficial due to the deposition of sediment along the northern river bank providing additional mussel habitat. Adverse effects to the other listed threatened or endangered species resulting from implementation of the proposed project would not be anticipated due to the lack of suitable habitat, and because the only species with suitable habitat (Piping Plover) is only afforded protection when the proposed project is wind-related according to the IPaC from USFWS.

4.4.2 *Fish and Wildlife*

The Migratory Bird Treaty Act (MBTA) protects all migratory birds and their parts. Under the MBTA, it is unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory birds, including feathers or other parts, nests, or eggs. Nearly all native North American bird species are protected by the MBTA. The skies above Fort Bend County are listed as part of the North American Flyway, specifically the Central Flyway. This flyway is used by neo-tropical birds passing over Fort Bend County annually on their migration southward to warmer climates. These birds are protected by the MBTA.

While no longer listed as a threatened or endangered species, the bald eagle is protected under the MBTA and the Bald and Golden Eagle Protection Act of 1940. The Bald and Golden Eagle Protection Act prohibits the take, possession, sale, purchase, barter, offer to sell, transport, and export or import of any bald or golden eagle, alive or dead, including any part, nest, or egg. Potential habitat for the

bald eagle is present, as the project area includes a section of the Brazos River, and river systems are a favored habitat for this species. There are no known or observed nests in the trees adjacent to the northern river bank.

Any use of the project area by bald eagles would be expected to be transitory.

The Fish and Wildlife Coordination Act (FWCA) was enacted to protect fish and wildlife when federal actions result in the modification of natural streams or bodies of water. Coordination with the USFWS would be required if a natural stream or water body modification is included in a proposed project. Project-specific information was obtained from the USFWS through a query made to the Service's IPaC database.

Under Section 305(b) of the Magnuson-Stevens Fishery Management and Conservation Act (1996), Fishery Management Councils (FMCs) and other federal agencies are required to identify and protect important marine and anadromous fish habitat, known as Essential Fish Habitat (EFH). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. The section of the Brazos River in the project area is not tidally influenced. Additionally, NOAA's EFH mapper shows no EFH within or near the project area. Therefore, no impacts to EFH would occur and coordination relative to EFH would not be required.

The Texas fawnsfoot (*Truncilla macrodon*), a freshwater mussel, is proposed to be listed as a threatened species. As a proposed species, this mussel species does not receive full protection under the ESA. The unconsolidated substrate of the Brazos River may provide potential habitat for this species. The potential habitat in the proposed construction footprint, though, is subject to scour and erosion from flood water flow velocities conveyed through this section of the Brazos River. Construction of bank stabilization measures in the project area would affect only small areas of open water along the toe of the northern Brazos River bank. The bendway weir structures would extend partially within the river channel. Stabilizing riprap proposed to be placed at the base of the weirs would affect limited areas of the river bottom. A mussel survey would be conducted within the Brazos River in the area of the proposed project prior to the initiation of construction activities. Mussels collected in the project area would be relocated in accordance with an Aquatic Resources Relocation Plan approved by the TPWD. The completed project may enhance the habitat quality for these mussels in the project area by the bendway weirs slowing flow velocities and depositing sediment along the accreting northern bank of the river.

4.4.2.1 No Action Alternative

Under the No Action Alternative, aquatic and/or terrestrial wildlife would not be impacted.

4.4.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, in the short term, mobile aquatic and terrestrial species would likely avoid the project area during construction. Wildlife habitat would be disturbed during construction, as some vegetation along and adjacent to the river bank would be removed to construct the proposed bank stabilization. River sediments may also be disturbed as the proposed project is constructed. The construction contractor may install silt curtains or similar measures in areas of sediment disturbance to limit the dispersion of sediments in the water column. Disturbance of riparian vegetation along the upper riverbank would be the minimum necessary to stabilize the bank and halt continued future erosion. Construction activities that would involve vegetation removal would be planned to occur outside the nesting season of migratory birds. The proposed project would not impact EFH.

The long-term impacts of the proposed project would be primarily positive. Preventing the continued erosion of the northern river bank would reduce the introduction of sediments from the project area into the Brazos River. Reduced flood water velocities and the capture and accretion of sediment in the area of the bendway weirs may enhance aquatic habitat in the project area. The regraded bank slope may provide some wildlife habitat compared to the existing eroded, sheer river bank with little to no vegetative cover. As aquatic and terrestrial areas equilibrate to the new conditions following construction, wildlife would be expected to return to the project area. In the long term, adverse impacts to aquatic and terrestrial wildlife would not be anticipated as a result of constructing the proposed project.

4.5 Cultural Resources

Cultural resources is an inclusive term that consists of the subsets of historic-age and archeological resources that provide the physical evidence of past human activity, and includes any prehistoric or historic structure, building, object, archeological site, district (a collection of related structures, buildings, objects and/or archeological sites), landscape or natural features significant to a particular group of people traditionally associated with it, and cemeteries that may have historical, architectural, engineering, archeological, or cultural significance. For the proposed project, historic-age resources primarily refer to structures, buildings, objects, and potential historic districts that are 45 years of age or older, while archeological resources more specifically refer to sites and districts where remnants of physical evidence (artifacts, features, and ecological evidence) of a past culture are present.

FEMA must meet applicable cultural resources compliance requirements under NEPA, Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the Antiquities Code of Texas, and be in accordance with the Advisory Council on Historic Preservation (ACHP) regulations pertaining to the protection of historic properties (36 CFR Part 800). Historic properties, as defined by the NHPA, are those properties that are included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). In addition, the proposed project falls under the purview of the Antiquities Code of Texas due to the involvement of lands monitored, operated, and maintained by FBCLID7, which is a political subdivision of the State of Texas, and requires the State Historic Preservation Office (SHPO)/Texas Historical Commission (THC) to review actions that have the potential to disturb prehistoric or historic sites within the public domain. Regulations pertaining to the code can be found in Title 13 Part 2, Chapter 26 of the Texas Administrative Code, Rules of Practice and Procedure. The THC may require archaeological investigations to take place in all potentially affected areas to identify potential impacts to cultural resources. Such investigations are regulated through an Antiquities permitting process, which establishes the terms under which work may proceed. Thus, prior to any survey, testing, data recovery, or monitoring investigations, an Antiquities Permit from the THC would be required. Coordination with the SHPO/THC resulted in the issuance of a Texas Antiquities Permit to conduct cultural resources investigations on the project site (Permit No. 9425).

4.5.1 Archeological Resources and Historic Properties

The area of potential effects (APE) for archeological resources is defined on the basis of construction plans and encompasses the limits of the proposed project, permanent and temporary easements, and utility relocations. Background research and literature review were conducted for a 1,000-meter (m) study area around the APE to identify known historic structures, districts, cemeteries, archeological sites, and previous archaeological surveys. Sources reviewed included the Texas Archeological Sites Atlas and the Texas Historic Sites Atlas, databases maintained by the SHPO/THC, along with aerial photographs and topographic maps. As a result of the background research and literature review, seven previous archaeological surveys have been conducted within 1,000 m of the APE between 1986 and 2008 (Table 3). In addition, 15 previously-recorded archaeological sites are present within 1,000 m of the APE, including 12 twentieth century historic sites, a single prehistoric site, and two historic cemeteries identified by site trinomials (Table 4). Eight of the twentieth century sites have been recommended for no further work, one remains unevaluated, one remains undetermined, and four have been determined ineligible for listing in the NRHP. Prehistoric site 41FB240 has been determined not eligible for the NRHP. Two of the previous investigations and site 41FB168, a twentieth century homestead site, are within the APE. Three cemeteries were identified within 1,000 m of the APE: The Watkins Cemetery, Thompson's Chapel Cemetery, and an unnamed historic cemetery (41FB242) south of the Brazos River near the northwest boundary of a post-1995 housing development on the east side of SH 99. The Watkins Cemetery was designated a Historic Texas Cemetery (HTC) in 2008 (see Table 4). None of the cemeteries are within the APE.

Table 3: Previous Archaeological Investigations within 1,000 m of the APE

Map ID Number	Project Type	Date	Antiquities Permit No.	Agency / Firm	Description
1	Areal Survey	1988	N/A	USACE – Galveston District / Unknown	No Data
2	Areal Survey	1988	682	USACE – Galveston District; City of Sugar Land / Unknown	Recording of Site 41FB181
3	Testing	1989	682	USACE Galveston District / Unknown	Testing of Site 41FB178
4	Linear Survey	1992	N/A	USACE Galveston District / Unknown	No Data
5	Areal Survey	2008	N/A	USACE Galveston District / Moore Archeological Consulting	Cultural resources survey for New Territory Residential Development; discovery of sites 41FB235 - 41FB243
6	Areal Survey	2008	4778	USACE – Galveston District; City of Sugar Land / Raba-Kistner Consultants, Inc.	Cultural resources survey of 77 acres; revisit of 3 archaeological sites (41FB178, 41FB241, and 41FB237)
7	Areal Survey	2008	4915	Federal Housing Administration / Texas Department of Transportation (TxDOT) / Ecological Communications Corp	Archaeological survey of SH 99; revisit of 7 archaeological sites (41FB167, 41FB169, 41FB176, 41FB191, 41FB194, 41FB195, and 41FB242)

Source: Texas Archeological Sites Atlas (2019)

Table 4: Previously-Recorded Archaeological Sites and Cemeteries within 1,000 m of the APE

Site / Cemetery	Cultural Period(s)	Site / Cemetery Description	Recommendation	Distance (m) from APE
41FB166	Historic	Early twentieth century irrigation well and pump; no artifacts	No further work - 1988	1,000 m northeast
41FB167	Historic	Early twentieth century well; no artifacts	No further work - 1988	95 m north
41FB168	Historic	Early twentieth century homestead site; wire nails	No further work - 1988	Within APE
41FB169	Historic	Early twentieth century tenant house site; brick fragments, window glass	No further work - 1988	615 m north
41FB170	Historic	Early twentieth century tenant house site; brick fragments, colorless glass, wire nails, milk glass	No further work - 1988	835 m north
41FB171	Historic	Early to mid-twentieth century tenant house site; possible pump, patinated glass shards, bricks	No further work - 1988	1,000 m north
Thompson's Chapel Cemetery / FB-C125	Historic	Thompson's Chapel Cemetery; 1961-present / 54 interments	No designation	615 m northwest
41FB178	Historic	Early to mid-twentieth century house site; scattered sheets of tin, wire nails	No further work - 1988	750 m northeast
41FB180	Historic	Early twentieth century tenant house site; brick fragments	No further work - 1988	240 m north

Site / Cemetery	Cultural Period(s)	Site / Cemetery Description	Recommendation	Distance (m) from APE
41FB181 / Watkins Cemetery / FB-C129	Historic	Watkins Cemetery; 6 to 8 graves (1831 – 1942); possible tenant farmer's cemetery	HTC Designation 2008; Avoidance or relocation of burials recommended - 1988	140 m north
41FB194	Historic	Early to mid-twentieth century trash dump; porcelain fragment, colorless glass on surface, colorless glass below surface	Not evaluated - 1990	440 m north
41FB235	Historic	Twentieth century concrete and brick cistern; debris of riveted steel cistern; sheet metal, brown and blue glass shards, whiteware fragments	Not eligible - 1996	575 m south
41FB236	Historic	Mid-twentieth century sheet metal cistern or trough; windmill anchors	Not eligible - 1996	615 m south
41FB239	Historic	Mid-twentieth century home site (occupied); corral, 3 concrete water troughs	Not eligible - 1996	800 m south
41FB240	Prehistoric	Subsurface prehistoric lithic scatter	Not eligible - 1996	115 m south
41FB242 / Unnamed Cemetery	Historic	Cemetery; concrete rubble, limestone cobble, barbed wire	Not eligible - 1996	485 m south

Source: Texas Archeological Sites Atlas (2019)

A records review of the Texas Historic Sites Atlas and NRHP database was conducted in June 2019 to identify previously-recorded and/or designated historic resources within one-quarter mile (1,300 feet) of the project area. This review included properties listed in the NRHP, National Historic Landmarks, State Antiquities Landmarks (SAL), Recorded Texas Historic Landmarks (RTHL), Official Texas Historical Markers (OTHM), and HTCs. Based on the records review, one HTC was identified in the study area, which is the Watkins Cemetery (Cemetery ID# FB-C129). No other previously-recorded and/or designated historic resources were identified.

Additionally, preliminary background research was conducted to assess the potential for the presence of historic resources. Sources reviewed during the background research included historic aerial photographs (1953-2018 [Earthexplorer.com]), historic topographic maps (1970-1980 [Perry-Castañeda Library Map Collection]), Fort Bend County Appraisal District, and the Handbook of Texas Online.

4.5.1.1 No Action Alternative

Under the No Action Alternative, no impacts to historic properties or archeological resources would occur.

4.5.1.2 Proposed Action Alternative

Common prehistoric site types in the region include campsites, lithic procurement sites, and burned rock middens, which are common along streams and stream confluences, and in upland margins and terraces. Sites in floodplain settings may be deeply buried, while sites located in upland contexts tend to be at the surface or shallowly buried. Based on the overall site patterns in Fort Bend County, prehistoric archaeological sites are likely to occur within a few hundred meters of a water source. Historic sites are most often located near historic transportation routes in upland settings and may consist of aboveground structures or structural elements and/or buried (archaeological) historic deposits. Historic sites generally have a greater surface visibility, because either they are not buried or are not buried as deeply as prehistoric sites. Within Fort Bend County, common historic site types include early settlement sites, farmsteads, ranches, cemeteries, and water features such as wells and cisterns. The density of archaeological sites relative to the amount of previous investigations indicates there is excellent potential for the occurrence of unrecorded prehistoric and historic sites within the APE.

An evaluation of natural conditions affecting the integrity potential for archaeological sites was undertaken and included an examination of the geologic and pedologic setting. Soils within the APE are classified as the Pledger-Brazoria-Norwood association, which consists entirely of Holocene-age alluvial soils located on the floodplains of the Brazos River that are comprised of clay, silt, and sand (Barnes 1982). These soils have the potential to contain cultural materials in a deeply buried (>1 m) context. The extent of past disturbances in the APE is primarily due to the construction and maintenance of the surrounding soccer fields, the existing levee at the northern boundary of the project area, and the SH 99 bridge. Review of aerial photographs indicates that much of the APE is relatively undeveloped and prior impacts are expected to be minimal.

As a result of the background research, along with the presence of numerous historic and prehistoric archaeological sites in the surrounding region and the historic farming activities in this area, the APE appears to exhibit excellent potential to contain previously-unrecorded archaeological sites in well preserved and deep burial contexts with the appropriate integrity to be considered eligible for listing in the NRHP or to merit SAL designation.

From July 12, 2020 through July 17, 2020, under Texas Antiquities Permit No. 9425, project archaeologists conducted a series of 20 trenches excavated by a trackhoe within accessible locations of the APE along the northern bank of the Brazos River. All trenches were excavated at least four m (approximately 13 feet) long and one m (approximately 3.3 feet) wide, to a depth equivalent to the maximum reach of the trackhoe, approximately 4.5 m (15 feet). No archaeological deposits were discovered. The findings of this investigation were submitted to the THC, along with an Archaeological Monitoring and Unanticipated Discover Plan. THC concurrence was received on November 9, 2020.

As mentioned in the SHPO concurrence letter, dated November 9, 2020, areas where ground disturbance will occur will be monitored by a professional archeologist during construction. If cultural materials are encountered, the monitor will stop construction in the immediate vicinity and examine the discovery. Construction may take place beyond a 50 ft. buffer surrounding the find.

4.5.2 Indian Cultural/Religious Sites

Consultation with tribes (Tonkawa Tribe of Indians of Oklahoma, Kiowa Tribe, Comanche Nation, Alabama-Coushatta Tribe of Texas) was conducted per 36 CFR §800.2(c)(2)(i)(B) on August 11, 2021. The tribes did not provide comments within 30 days or declined to comment. FEMA has determined that proposed project will not adversely affect traditional, religious, or culturally significant sites.

4.6 Socioeconomic Resources

This section discusses population and demographics, including environmental justice (EJ) populations adjacent to the proposed project area. This section also provides information on existing conditions for hazardous materials, noise, traffic, public services and utilities, public health and safety, land use, and aesthetics.

4.6.1 Population, Demographics, and Environmental Justice

The 2000 and 2010 Census population and the 2019 five-year American Community Survey (ACS) population estimates for Fort Bend County are shown in Table 5. Between 2010 and 2019, the population for Fort Bend County increased by approximately 38 percent. Fort Bend County was the twelfth-fastest-growing county in the United States, with a population of 10,000 or more from April 1, 2010 to July 1, 2019. (U.S. Census Bureau 2019c).

Table 5: Population Statistics for Fort Bend County

Geographic Area	Population		
	2000	2010	2019
Fort Bend County	363,964	585,375	765,394

Source: U.S. Census Bureau 2000, 2010, and 2019a

EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” requires each Federal Agency to “...make achieving EJ part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations.”

As provided in the April 1998 EPA guidance, Defining Minority and/or Low-Income Population, minority and low-income populations are defined by a numeric measure. A minority population is defined as a group of people and/or a community experiencing common conditions of exposure or impact that consist of persons classified by the U.S. Census Bureau as Black, Asian, American Indian or Alaska Native, Hispanic, or other non-white persons, including those persons of two or more races. Census block group level data was used to identify EJ communities. The 2019 5-year ACS data is the latest data available from the U.S. Census Bureau. Census block group data identify areas of EJ populations in the project area. The race and ethnicity for Census block groups within or adjacent to the project area is shown in Table 6 and census block groups with 50 percent or higher minority populations (high minority) are depicted in Exhibit 8.

For population and demographic discussions, existing conditions were examined at the county, city, and Census block group levels for areas that encompass the proposed project improvements. To evaluate potential EJ issues, the low-income population was defined as a group of people and/or a community that, as a whole, lives below the national poverty level. The average poverty level threshold for a family of four people in 2021, as defined by the U.S. Department of Health and Human Services, was a total annual household income of \$26,500. For purposes of determining low-income populations, median household income was examined using the U.S. Census Bureau poverty estimates for 2019 (over a 5-year average), as reported in the ACS.

Median household income (MHI) at the Census block group level is shown in Table 6 for Fort Bend County and the City of Sugar Land. MHI is defined as the income of households and all other individuals 15 years or older (U.S. Census Bureau 2014). The average MHI ranges from a low of \$88,977 in Tract 6739.01, Block Group 4 to a high of \$172,727 in Tract 6739.01, Block Group 2 (U.S. Census Bureau 2019b). Five of the seven Census block groups within the FBCLID7 area/New Territory community have a 50 percent or higher minority population. The largest ethnic population is Asian.

Table 6: Population and Demographic Statistics for the County, City and Census Block Groups in the Project Vicinity

	Population ¹	Hispanic ²	White ²	Black or African American ²	American Indian and Alaska Native ²	Asian ²	Native Hawaiian and Other Pacific Islander ²	Some Other Race ²	Two or More Races ²	Percent Minority ^{2a}	Median Household Income ³
County and City											
Fort Bend County	765,394	24.1	34.4	20.2	0.2	19.2	0.1	0.2	1.7	65.6	\$97,743
City of Sugar Land	118,709	9.6	42.6	6.4	0.1	39.0	0	0.2	2.0	57.4	\$121,274

Census Block Groups in the Community Affected by the Proposed Project Improvements											
Tract 6738, Block Group 1	2,735	16.9	29.9	6.0	0	45.2	0	0	2.0	70.1	\$105,272
Tract 6738, Block Group 2	3,479	8.6	15.3	8.4	0	66.2	0	0	1.6	84.7	\$124,167
Tract 6739.01, Block Group 1	2,402	6.7	28.7	3.2	0	60.4	0	0	0.9	71.3	\$159,338
Tract 6739.01, Block Group 2	2,224	11.9	37.4	7.9	0	38.8	0	0	3.9	62.6	\$172,727
Tract 6739.01, Block Group 3	2,632	8.5	55.6	6.3	0	25.9	0	0	3.7	44.4	\$162,228
Tract 6739.01, Block Group 4	1,702	8.0	54.1	7.5	0	24.4	0	0	5.9	45.9	\$88,977
Tract 6747, Block Group 1	2,916	12.8	21.4	24.3	0	40.8	0	0	0.6	78.6	\$130,909

Source: U.S. Census Bureau

1. 2019a American Community Survey, 5-year Estimates, Table B01003 Total Population

2. 2010 Summary File 1, Table P9, Hispanic or Latino, and Not Hispanic or Latino by Race

3. 2019b American Community Survey, 5-year Estimates, Table B19013 Median

Household Income a - Percent minority includes all non-white races and persons of Hispanic origin

Bold cells are high minority (i.e., 50 percent or greater) Census block groups

4.6.1.1 No Action Alternative

Under the No Action Alternative, if FBCLID7's levee is breached there would a direct economic impact to the New Territory community, which has an EJ population. According to a cost-benefit analysis prepared by the project team in 2018, if the project is not implemented and the levee is breached, significant economic impacts would be anticipated. The No Action Alternative could have disproportionately high and adverse impacts on EJ populations due to flooding of homes, schools, and other services used by these populations. The locations of the EJ populations are shown in Exhibit 8

4.6.1.2 Proposed Action Alternative

During project construction, earth-moving and bank stabilization activities would be limited to areas adjacent to the Brazos River. The benefit of the proposed project would be the protection of residential areas, schools, commercial facilities, recreation areas, and SH 99 from a catastrophic levee breach.

The planned improvements during the short term would not have an effect on population growth or employment trends within the surrounding community, city, or county located in the general vicinity of the proposed project. As discussed in Sections 4.6.2 through 4.6.8, short-term impacts during construction would impact recreational resources such as the adjacent soccer fields and mountain bike trails along the upper river bank. The soccer fields and mountain bike trails adjacent to the Brazos River would be closed for approximately one year during construction. Portions of the existing mountain bike trails occur within the construction footprint of the proposed bank stabilization improvements. These portions of the trails

would likely be lost if the river bank erosion is allowed to continue. The mountain bike trails would need to be reestablished north and/or west of their current location due to construction of the proposed bank stabilization improvements. The soccer fields and mountain bike trails are currently located on land owned by FBLID7 and therefore are subject to protection by Texas Parks and Wildlife Code Chapter 26 – Protection of Public Parks and Recreation Lands. However, impacts to these recreational areas would only be temporary. FBLID7 would restore the soccer fields to their pre-construction condition, and mountain bike trails would be reestablished along the upper bank with input from local stakeholders and trail users. The New Territory Residential Community Association would work cooperatively with FBCLID7 and would be responsible for maintaining these recreational facilities following the completion of construction.

For the long term, there would be no displacements of occupied structures, residences, or businesses. The benefit of the proposed project would be to protect residential areas, schools, commercial facilities, recreation areas, and SH 99 from a catastrophic levee breach. Implementation of the proposed project would not have disproportionately high and adverse impacts on the local community, including the EJ populations.

4.6.2 *Hazardous Material*

A number of online databases of regulated hazardous materials and waste sites were searched to determine if hazardous materials were present in the project study area. The databases reviewed include:

- EPA listings of regulated facilities using the EnviroFacts web browser (Resource Conservation and Recovery Act (RCRA) Info, Toxic Release Inventory, Superfund, etc.)
- EPA National Response Center
- EPA How's my Waterway
- EPA Brownfields Cleanups
- U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Incident Reports
- Railroad Commission of Texas (RRC) online database of permitted oil and gas wells
- RRC online geographic information system (GIS) database of pipelines and new permitted pipelines
- RRC online GIS database of orphan wells
- Texas Water Development Board (TWDB) online GIS database of drilled water wells
- TCEQ's Industrial and Hazardous Waste Sites
- TCEQ's Industrial and Hazardous Waste Sites with Corrective Action
- TCEQ's Superfund listings
- TCEQ's closed municipal landfills sites
- TCEQ's registered petroleum storage tank (PST) listings
- TCEQ's leaking PST listings

None of these sources indicated that there were records of facilities or regulated sites that use or manage hazardous materials within or adjacent to the project area.

4.6.2.1 No Action Alternative

Under the No Action Alternative, no impacts to hazardous materials would occur.

4.6.2.2 Proposed Action Alternative

Although subsurface hazardous materials are not anticipated to be present, excavation activities could expose or otherwise affect subsurface hazardous wastes or materials. If any hazardous materials are discovered, generated, or used during implementation of the proposed project, they would be disposed of and handled by the project contractor in accordance with applicable local, state, and federal regulations.

4.6.3 Noise

Noise is generally defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities such as sleeping, conversation, and recreation, or when it causes adverse health effects. Noise levels from construction activities or ground transportation sources depend on a number of factors including equipment type, volume, and speed. Potential noise impacts depend on the location of the noise source(s), distance to a sensitive noise receiver location, and whether any barriers to sound propagation exist between the noise source and receiver.

Chapter 2 Section 2-362 of the City of Sugar Land's Code of Ordinances addresses noise-related regulations. The regulations specify a maximum of 65 decibels, A-weighting scale (dBA) during the daytime hours and 50 dBA during nighttime hours for residential properties. Noise levels must be determined by measuring the dBA ten feet inside the property line of the noise receiver location.

The proposed project is located along a bend of the Brazos River adjacent to SH 99 in Sugar Land, Texas. The New Territory Sports Complex is located west of SH 99 and north of FBCLID7's flood protection levee. The flood protection levee is a continuous earthen berm that is elevated approximately six feet above natural ground. Soccer fields associated with the sports complex are located within the project area south of the flood protection levee. West of SH 99, the nearest residences are located on the north side of New Territory Boulevard approximately 200 feet from the flood protection levee. East of SH 99, single-family residences abut the northern side of the flood protection levee.

4.6.3.1 No Action Alternative

The No Action Alternative would have no effect on ambient noise in the New Territory community.

4.6.3.2 Proposed Action Alternative

It is anticipated that short-term noise levels within and adjacent to the project area would increase during construction, primarily due to operation of construction equipment. Because of the nature of the proposed work, it is expected that only a limited number of pieces of heavy construction equipment and vehicles, such as backhoes, loaders, material-hauling vehicles, and pile drivers, would be in operation in the project area during the construction period. Tracked construction equipment would operate along the northern river bank as the bank would be regraded and shaped. Pile-driving equipment would operate in the lower portion of the northern river bank, which is approximately 25 feet below the top of the bank. The elevation difference between the lower and upper portions of the northern river bank would thus serve as a barrier to the propagation of impact pile-driving noise towards residences located to the north.

The proposed project would contribute to temporary, short-term increases in noise levels near the areas of construction during the construction period. Noise levels would be mitigated by operating equipment only during periods of actual construction of the proposed project and maintaining muffler systems on all construction equipment. In addition, construction activities would take place only during daytime hours. At distances of approximately 400 to over 500 feet from the areas of proposed construction, noise levels would not be expected to be above noise ordinance threshold levels at any residential property.

Once construction is complete, the proposed project would not be a generator of noise, and ambient noise levels would return to pre-construction levels. Therefore, there would be no long-term effects on noise.

4.6.4 Traffic

The project area encompasses a portion of the Brazos River and the area extending from the northern river bank to FBCLID7's flood protection levee. SH 99, which is a four-lane tollway with discontinuous frontage roads, traverses the eastern portion of the project area. SH 99 currently operates at free-flow conditions. In the northwestern portion of the project area, New Territory Boulevard generally parallels the flood protection levee in a northeast-southwest direction. New Territory Boulevard intersects with SH 99 north of the project area. Residential streets are present in developed areas of the New Territory community north of the project area.

During construction of the proposed project, trucks carrying construction equipment or materials would be expected to travel on SH 99 to New Territory Boulevard then proceed west-southwest on New Territory Boulevard to the general area of the New Territory Sports Complex. Construction equipment and vehicles would pass over the flood protection levee at designated, reinforced locations to reach the area of the soccer fields south of the levee where equipment and materials would be staged during construction.

Ingress and egress to the eastern portion of the project area east of SH 99 would be available only from the northbound SH 99 travel lanes. No frontage roads are present in this area of SH 99, as the SH 99 bridge structure over the Brazos River supports only the four main travel lanes (two lanes in each direction). Construction equipment and vehicles accessing the project area east of SH 99 for construction activities and materials staging would use the outermost SH 99 northbound travel lane to turn right immediately after crossing the Brazos River. Exiting the project area would require equipment and vehicles to enter the SH 99 northbound travel lanes north of the SH 99 bridge.

4.6.4.1 No Action Alternative

The No Action Alternative would allow erosion of the northern river bank to continue, potentially jeopardizing the integrity of the northern SH 99 bridge abutment, which could adversely impact a major north-south highway in the project area. A breach of the flood control levee could cause flood damage to streets in the general project area that would likely restrict or halt vehicular and emergency response traffic on roadways surrounding the project area.

4.6.4.2 Proposed Action Alternative

In the short term, construction of the proposed project would be expected to have a minor and temporary effect on traffic, as vehicles transporting equipment and materials would be entering and exiting from SH 99 to travel on New Territory Boulevard or to access the project area east of SH 99. During construction, there would be an expected temporary increase in truck traffic in the general project area. Traffic control measures may be implemented by the contractor to accommodate slower-moving construction vehicles traveling north on SH 99 as they enter and exit the eastern portion of the project area east of SH 99. Vehicular travel lanes must remain open during construction and would not adversely affect emergency services or responders.

The proposed project would likely involve work from barges within the Brazos River. There is no known commercial navigation on the Brazos River in the project area, although small watercraft may occasionally pass through this section of the river. Barges used temporarily for construction would be expected to be positioned adjacent to the northern river bank and would not be an impediment to the free navigation of small watercraft that may operate on the river in the project area.

In the long term, the Proposed Action Alternative would have no effect on SH 99 or New Territory traffic, as the proposed project would be the stabilization of a river bank that would not be associated with vehicular traffic traveling on SH 99 or within the New Territory community. A long-term benefit would be that the SH 99 bridge structure would be protected from continued bank erosion, thereby avoiding the need for roadway closures and traffic disruptions while roadway repairs are performed. Similarly, there would be no long-term effect on watercraft operating on the Brazos River. The bendway weir structures to be placed within the Brazos River channel as part of the proposed project would be properly signed to warn those navigating the river as to the presence of the structures.

4.6.5 *Public Services and Utilities*

The New Territory community is served by various municipal and private utility and service providers. A list of public service and utility providers is shown in Table 7.

Table 7: Utilities

Utility	Provider
Law Enforcement	Sugar Land Police Department
Fire Protection/Emergency Response	Sugar Land Fire-Emergency Medical Services
Solid Waste Collection	City of Sugar Land - Republic Waste
Water	City of Sugar Land
Sewer	City of Sugar Land
Natural Gas	CenterPoint Energy
Cable/Internet	Comcast
Telephone	Windstream-Sugar Land Telephone/AT&T
Electric	CenterPoint Energy

4.6.5.1 No Action Alternative

The No Action Alternative would not affect any public services or utilities in the general project area. However, a breach of the flood protection levee and the ensuing flooded conditions could strain the resources and capabilities of local law enforcement and emergency responders and cause significant damages to utilities and infrastructure within the New Territory community.

4.6.5.2 Proposed Action Alternative

For the Proposed Action Alternative, overhead and subsurface utilities were identified during the planning phase of the project. Utilities within the proposed construction footprint would be avoided or relocated prior to construction to minimize possible short-term interruptions in utility service. CenterPoint Energy overhead electric lines traverse the mid-portion of the project area in a north-south direction, generally west of and parallel to SH 99. Coordination has been conducted with CenterPoint Energy regarding the overhead electric lines, and CenterPoint Energy indicates that the tower structure supporting the overhead electric lines located north of the northern river bank within the project area is to be relocated farther north, outside the project construction footprint. The reduced risk of flooding would allow law enforcement, fire fighters, and emergency personnel to respond to emergency situations within the New Territory community without flood waters or damaged infrastructure compromising response times. No long-term effects to utilities or the provision of public services would be expected from implementation of the Proposed Action Alternative.

4.6.6 *Public Health and Safety*

FCBLID7's flood protection levee currently protects the New Territory community from Brazos River flooding. However, should the flood protection levee become compromised and fail, the resulting flooding could create a potential life-threatening situation accompanied by the damage or destruction of homes, businesses, utilities, and infrastructure. In addition, standing water resulting from flooded conditions could pose a health and safety risk due to the presence of physical and biological hazards.

4.6.6.1 No Action Alternative

The No Action Alternative would leave the northern bank of the Brazos River in the project area in its current unprotected condition. Future flooding events would subject the river bank to continued erosion and bank failures. Continued erosion and river migration would likely eventually encroach onto and breach FBCLID7's flood protection levee, resulting in flooding of the New Territory community. River erosion and migration would continue to pose a risk to public health and safety due to potential future flooding events.

4.6.6.2 Proposed Action Alternative

The Proposed Action Alternative would stabilize the eroding northern bank of the Brazos River in the project area, which would decrease the potential for continued erosion and bank failures that could lead to a breach of FBCLID7's flood protection levee and consequent flooding of the New Territory community. The reduced risk of flooding would reduce potential adverse impacts to public health and safety that could

result from flooding in the New Territory community. Appropriate signage and barriers would be erected prior to the initiation of construction to protect pedestrians, cyclists, and recreationists from unintentionally entering areas of active construction.

4.6.7 Land Use

The FBCLID7 project area consists of a section of the Brazos River in the vicinity of SH 99, and property immediately north of the river that is partially undeveloped and partially developed as recreational soccer fields. Review of existing and future land use maps and aerial imagery, and observations made during field visits indicates that land use north of the project area is primarily residential, with some commercial development and public facilities. South of the project area is undeveloped land associated with the floodway of the Brazos River.

4.6.7.1 No Action Alternative

The No Action Alternative would have no effect on land uses within or surrounding the project area.

4.6.7.2 Proposed Action Alternative

The Proposed Action Alternative would stabilize the northern bank of the Brazos River in the project area. Protection of the river bank and FBCLID7's flood protection levee would not be expected to affect or influence current land uses in the project area. As a result of the proposed project, the soccer fields and mountain bike trails adjacent to the Brazos River would be closed for one year during construction. Portions of the existing mountain bike trails have been lost because of the river bank erosion. The soccer fields would be restored and the mountain bike trails are proposed to be reestablished outside the footprint of the bank stabilization improvements subsequent to construction. The soccer fields and mountain bike trails are currently located on land owned by FBLID7; therefore, these recreational facilities are subject to protection by Texas Parks and Wildlife Code Chapter 26 – Protection of Public Parks and Recreation Lands. However, impacts to these recreational facilities would only be temporary and would be restored and reestablished by FBLID7 with input from local stakeholders and those who use the facilities. The New Territory Residential Community Association would be responsible for maintaining these recreational facilities after construction is completed.

Aesthetics

Within the project area, the Brazos River is approximately 300 feet wide. The northern bank of the river has been severely eroded by flooding events experienced in recent years. Immediately east of SH 99, the northern bank of the river has eroded over 100 feet, advancing closer to FBCLID7's flood protection levee located north of the river. The flooding has eroded earthen material from the bank, dislodging trees and other vegetation that has either been swept away with the flood waters or has fallen onto the lower portion of the river bank to decay. The severe erosion has created a sheer and nearly vertical bank with exposed soil and little to no vegetation. At the top of the bank, areas of trees, vines, shrubs, and herbaceous vegetation are present, but would be susceptible to loss from future flooding events that would continue to erode the bank. Several soccer fields in the northern portion of the project area serve as a recreational amenity for the New Territory community. In the area of the SH 99 bridge structure, the eroding bank has exposed a concrete drill shaft wall that was recently constructed to protect the SH 99 northern bridge abutment.

Immediately north of the project area is the New Territory master-planned community. SH 99, a toll facility with two lanes in each direction separated by a raised grass median, traverses through New Territory in a north-south direction. Frontage roads are intermittent along the roadway. The New Territory Sports Complex, located west of SH 99 and south of New Territory Boulevard, includes soccer fields and baseball fields, and serves as a recreational amenity for the community. Access to the sports complex is from New Territory Boulevard. FBCLID7's flood protection levee traverses through the sports complex generally from west to east, with the soccer fields located south of the levee. Brazos River/ Memorial Park is located on either side of SH 99 south of the Brazos River. Facilities include a nature trail and picnic areas.

Partial views of the project area are primarily available from traveling on the SH 99 bridge across the Fort Bend County Levee Improvement District No. 7

Brazos River. The sheer and eroded northern bank of the river is a prominent feature. Mature trees growing along portions of the northern and southern banks of the river are notable because of their size and density. The CenterPoint Energy overhead electric lines are visible, as the lines are elevated on tall towers as the lines cross the Brazos River.

4.6.7.3 No Action Alternative

Under the No Action Alternative no improvements would be made to the existing river bank. The river bank would continue to erode and persist in displaying exposed soil on the sheer bank with little to no vegetation and the New Territory Sports Complex would remain in its current condition.

4.6.7.4 Proposed Action Alternative

The Proposed Action Alternative would have short-term impacts on aesthetics. Construction of the project would be visible to traffic traveling northbound and southbound on SH 99. Construction activities would include movements of earth-moving equipment and areas of stockpiled soil and construction materials. Cranes, barges anchored along the northern bank of the Brazos River, heavy construction equipment and vehicles, and trucks would be common items in the project area during construction. Construction equipment and stockpiled materials may be visible from some residential homes north of New Territory Boulevard and from some homes adjacent to the flood control levee east of SH 99. Residents would likely also note increased traffic on New Territory Boulevard as workers and trucks hauling materials to and from construction areas would primarily travel on this street.

In the long term, the stabilized river bank would exhibit a changed appearance from existing conditions. The eroded, sheer bank would be replaced with a sloped bank reinforced with stone riprap. The bendway weirs would be visible, extending partially into the Brazos River channel. The structural elements placed along the river bank may be perceived as a positive change compared to the previous actively eroding river bank.

4.7 **Summary Table**

NEPA guidelines and regulations define mitigation as (1) avoiding adverse impacts by not taking an action, (2) minimizing impacts by limiting the degree of action, (3) rectifying by repairing, rehabilitating, or restoring the affected environment, (4) reducing or eliminating impacts over time through preservation and maintenance activities, and (5) compensating for an impact by replacing or providing substitute resources or environments. During development of the proposed project, mitigation measures were considered and incorporated into the design concept in an effort to avoid and minimize impacts to the greatest extent practicable, while meeting the project purpose and need.

The overall physical environment within the project area would not be significantly impacted by construction of the proposed project, although the regraded and armored river bank would exhibit a changed appearance from the previous eroded, sheer bank. Table 8 summarizes the potential impacts of the No Action Alternative and the Proposed Action Alternative and identifies conditions or mitigation measures to minimize those impacts, where appropriate.

Table 8: Anticipated Affected Environment and Environmental Issues for the Proposed Action

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Geology, Soils, and Seismicity – Topography/Bathymetry	The Brazos River bank would continue to erode, resulting in long-term impacts to the existing elevation and channel depth of the river along the apex of the meander bend in the project area. Eroded sediments would be washed downstream to negatively impact water quality. River scour could potentially occur, deepening the channel and changing the existing bathymetry.	The topography of the project area would remain unchanged, with the exception of the regraded northern river bank. The bathymetry of the river and location of the thalweg would be stabilized.	N/A	N/A
Geology	Long-term change to Holocene age alluvial deposits (clays and silts) would occur through continued erosion and re-distribution along the river bank and within the channel during high river flow events. In the long term, the apex of the meander channel would continue to move laterally with the long-term result that FBCLID7's flood control levee would be compromised.	Potential change to the location of thalweg, reducing the bankfull-to-bankfull width due to sediment accretion on the outside meander (north bank). Pronounced bank erosion at the meander apex would be controlled. Secondary currents from helicoidal flow patterns at the SH 99 bridge may be managed through the use of proposed bank stabilization methods.	Texas Department of Transportation (TxDOT) and Fort Bend County Toll Road Authority notifications concerning bank stabilization in the SH 99 bridge area.	N/A

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Soils/Sediment	Long-term change to soils and sediments would occur through continued erosion and re-distribution along the river bank and within the channel during high river flow events. The existing silts, clays and silty loam soils would continue to scour unabated, negatively affecting water quality.	The existing sand-silt-clay sediment load would be reduced after construction. Sedimentation would respond to the change in the meander bank profile after the north bank (apex of the meander) is stabilized.	TCEQ	Preparation of a SWPPP and implementation of BMPs would minimize the introduction of pollutants (primarily sediment) in storm water runoff from entering waters of the United States. The contractor may install silt curtains in areas of sediment disturbance to limit the dispersion of sediments in the water column. Disturbance of riparian vegetation along the upper riverbank would be the minimum necessary to stabilize the bank and halt continued future erosion.
Seismicity and Faulting	No Impacts	No Impacts	N/A	The design of the bank stabilization measures would incorporate seismic stability criteria, as appropriate.
Air Quality	No Impacts	Short-term emissions would occur during construction.	TCEQ	BMPs, including dust control techniques such as covering of transported material, and watering of the construction area and haul routes to control dust emissions. Limit idling of construction equipment during periods when the equipment is inactive and maintain construction equipment in accordance with the manufacturer's specifications.

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Climate Change	No Impacts	Short-term GHG emissions would be minimal during construction.	N/A	Construction equipment would be monitored by the construction contractor(s) to be sure it is operating properly during the approximate 12-month construction phase. GHG emissions would be minimal when compared to total GHG emissions within the State of Texas.
Water Quality	No Impacts; however, erosion and migration of the Brazos River would continue in the project area.	Short-term impacts would include impacts to surface water during construction, primarily to the northern river bank. Long-term impacts would be largely beneficial, as the river bank would be protected from continued erosion and the bendway weirs and reconfigured bank toe would be expected to capture some volume of suspended sediments within the Brazos River that otherwise would be transported downstream.	TCEQ water quality certification through the issuance of the USACE permit	The TPDES program implements the National Pollutant Discharge Elimination System program. A SWPPP would be prepared prior to construction activities. Since the project would disturb more than five acres, a NOI would also be required. The SWPPP and BMPs would minimize the amount of pollutants that would enter into the Brazos River.
Waters of the United States, Including Wetlands	No Impacts	Direct minimal impacts to jurisdictional waters of the United States associated with the Brazos River are anticipated to occur. The USACE has issued a permit authorizing the proposed project activities within the Brazos River.	USACE	Two wetlands situated on the upper northern bank of the Brazos River would be avoided. FBCLID7's proposed work within the Brazos River has been authorized by the USACE without the requirement for compensatory mitigation.

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Floodplains	No Impacts	Short-term impacts would not be expected to occur during construction of the bank stabilization measures. Any short-term impact on the 100-year floodplain would be negligible. The proposed project would not result in an increased base discharge or increase the flood hazard potential to other structures. The proposed project would not affect the functions and services of the 100-year floodplain, nor would it impede or adversely redirect flood flows.	FEMA USACE Fort Bend County Drainage District	The proposed bank stabilization would be designed to be compliant with FEMA recommendations for construction in flood hazard areas.
Coastal	No Impacts	No Impacts	N/A	N/A
Threatened and Endangered Species and Critical Habitat	No Impacts	A short-term effect to individual mussels that may be present along the northern bank of the Brazos River might occur as the bendway weirs and stabilizing riprap are placed in limited areas of the river bottom. Long-term effects may be beneficial to mussel species due to the deposition of sediment along the northern river bank that could provide additional suitable habitat for the mussel species. No effects to other federally-listed species would be anticipated to occur.	USFWS Texas Parks and Wildlife Department (TPWD)	A mussel survey would be conducted within the Brazos River in the area of the proposed project prior to the initiation of construction activities. Mussels collected in the project area would be relocated in accordance with an Aquatic Resources Relocation Plan approved by the TPWD.

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Fish and Wildlife	No Impacts	Short-term impacts on wildlife habitat would occur during construction as some vegetation would be removed to regrade the northern river bank and construct the bank stabilization measures. No impacts would be anticipated to migratory bird species.	USFWS TPWD	Project construction affecting tree and shrub vegetation would be planned to occur outside the nesting season of migratory birds.
Historical	No Impacts	Based on prior research, the APE has a strong potential to have unrecorded archaeological sites. Field investigations conducted to date did not identify historical resources in the project area.	SHPO/THC	The project site would be actively monitored for historical resources during construction. If historic artifacts are uncovered during construction, activities would cease, and a survey of the discovery site would be performed.
Archaeological	No Impacts	Based on prior research, and the presence of archaeological sites in the general project area, the APE has a strong potential to have unrecorded archaeological sites. A pedestrian survey and deep trenching at selected sites within the project area did not result in the identification of archeological resources.	SHPO/THC	The project site would be actively monitored for archeological resources during construction. If archaeological artifacts are uncovered during construction, activities would cease, and a survey of the discovery site would be performed.
American Indian Cultural/Religious Sites	No Impacts	Project will not adversely affect traditional, religious, or culturally significant sites.	Tonkawa Tribe of Indians of Oklahoma Kiowa Tribe Comanche Nation Alabama-Coushatta Tribe of Texas	N/A

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Socioeconomic/ Environmental Justice	Potential adverse impacts to environmental justice communities resulting from flooding events.	There are no potential short-term impacts to population and employment. Long-term benefits would include stabilizing the river bank near FBCLID7's existing flood protection levee that currently protects numerous residences, schools, commercial facilities and recreational areas in the New Territory community.	FEMA	N/A
Hazardous Material	No Impacts	No short-term or long-term impacts would be anticipated.	Environmental Protection Agency	Although subsurface hazardous materials would not be anticipated to be present, excavation activities could expose or otherwise affect subsurface hazardous wastes or materials. If any hazardous materials are discovered, generated, or used during construction of the proposed project, they would be disposed of and handled by the project contractor in accordance with applicable local, state, and federal regulations.

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Noise	No Impacts	Short-term noise impacts would not be expected to occur in adjacent residential areas during the approximate 12-month construction period. There would be no anticipated long-term noise impacts.	City of Sugar Land	Noise levels would be mitigated by operating equipment only during periods of actual construction, and maintaining muffler systems on all construction equipment. Construction activities would take place only during daytime hours. At distances of 400 feet to more than 500 feet from the construction sites, noise levels would not be expected to be above noise ordinance threshold levels at any nearby residential property.
Traffic	No Impacts	Short-term impacts would likely occur to local traffic due to trucks transporting construction equipment and materials, and the trucks' use of SH 99 and New Territory Boulevard. No long-term impacts would be anticipated, as the proposed project would not be associated with routine vehicular traffic on SH 99 or local streets.	TxDOT City of Sugar Land	Implement a traffic control plan, if needed, during the construction phase of the project. Notify residents/businesses in the general area when construction is anticipated and any possible detours that may be needed.
Public Services and Utilities	No Impacts	Short-term impacts may occur to utility services due to the possible relocation of utilities prior to construction. Public services would not be expected to be impacted. There would be no anticipated long-term impacts.	Utility Providers City of Sugar Land Public Works Department	Coordination would occur with utility providers prior to construction. If any interruption of service is necessary to construct the project, affected users would be notified prior to the activity such that service interruption would be minimized to the extent practicable.

Resource Area	No Action Alternative	Proposed Action Alternative		
		Impacts	Agency Coordination/Permits	Mitigation BMPs
Public Health and Safety	There is a potential threat if the flood protection levee that protects numerous homes and businesses within the New Territory community is breached. This would be a continued risk to public health and safety due to potential future flooding events.	Short-term impacts would include protecting residents and recreationists during construction. There would be no anticipated long-term impacts. A long-term benefit would be stabilization of the currently eroding river bank, which would minimize the potential for a breach of the flood protection levee.	City of Sugar Land Public Works Department	Appropriate signage and barriers would be in place prior to construction to notify pedestrians and motorists of construction activities. Vehicular travel lanes would remain open during construction and would not be expected to adversely affect emergency services or responders.
Land Use	No Impacts	No Impacts	N/A	NA
Aesthetics	No Impacts	Short-term impacts would include construction of the proposed project, which would be visible to traffic traveling on SH 99, recreationalists at the sports complex, and possibly residents in areas adjacent to construction. No long-term impacts would be anticipated. A long-term benefit would be the stabilized northern river bank, which may be perceived as an improvement to the existing eroded, sheer bank with fallen and decaying trees in the project area.	N/A	N/A

5.0 CUMULATIVE IMPACTS

CEQ regulations implementing NEPA require an assessment of cumulative effects during the decision-making process for federal projects. Cumulative effects are defined as "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR Part 1508.7). Cumulative effects considered for the proposed bank stabilization project were determined by combining the effects of the proposed project with other past, present, and reasonably foreseeable future actions.

Other potential projects that may have a cumulative effect in conjunction with the proposed project are currently being assessed by the USACE. Hydraulic and erosion/sediment transport studies are currently being conducted for the Brazos River watershed. Based on the findings of these studies, potential solutions for identified erosion and sediment issues would be developed and evaluated for possible implementation in the Brazos River. A bank stabilization project was recently completed by Fort Bend County Municipal Utility District Number 140, located approximately 4.9 miles upstream of the FBCLID7 project area. The project involved riprap stabilization of approximately 1,700 linear feet of the northern bank of the Brazos River to halt further erosion of the riverbank.

Modeling performed for the proposed FBCLID7 project assessed in this document demonstrated that water surface elevations upstream and downstream of the project area would not be affected by construction of the proposed project. Modeling of proposed future projects would need to be conducted to similarly demonstrate that implementation of a future project would not adversely affect water surface elevations upstream and downstream of the proposed future project.

Coordination among the USACE, levee improvement districts within the region, Fort Bend County, and other interested parties is ongoing to review and discuss the current studies, and the implications of the study findings for planning and designing future projects. Overall, the proposed FBCLID7 project, in conjunction with other future projects, would not contribute to development that would promote the occupancy or modification of floodplains, wetlands, or other natural resources, or increase the flood hazard risk in existing developed areas. The proposed project, when considered with other past, present, and reasonably foreseeable future actions would not represent a cumulative impact on the environment. Stabilizing the northern river bank in the project area would arrest the current ongoing bank sloughing and the continued erosion and transport of sediment into downstream portions of the river.

6.0 RESOURCE AGENCY COORDINATION, PUBLIC INVOLVEMENT, AND PERMITS

6.1 Agency Coordination

Several local, state, and federal agencies were consulted as part of preparing this EA, including correspondence with the agencies and utilizing online resources. An agency coordination table is included in Appendix A, with copies of correspondence to and from the agencies. A list of agencies consulted is shown below.

Local Contacts:

- Brazos River Authority
- City of Sugar Land
- City of Sugar Land Public Works Department
- Fort Bend County Drainage District
- Fort Bend County Grand Parkway Toll Road Authority

- New Territory Residential Community Association

State Contacts:

- Texas Commission on Environmental Quality
- Texas Division of Emergency Management: David Jackson, State Hazard Mitigation Officer
- Texas General Land Office
- Texas Historical Commission: Mark Wolfe, State Historic Preservation Officer
- Texas Parks and Wildlife Department
- Texas Water Development Board

Federal Agencies:

- U.S. Army Corps of Engineers U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service

Federally Recognized Tribes:

- Tonkawa Tribe of Indians of Oklahoma
- Kiowa Tribe
- Comanche Nation
- Alabama-Coushatta Tribe of Texas

6.2 Public Involvement

FBCLID7 was created to construct levee and drainage improvements to provide protection to residential and commercial properties in the New Territory subdivision. The northern bank of the Brazos River in the area immediately south of FBCLID7 has eroded from recent flooding events in the river. The rate of erosion has been startling, as the river bank is encroaching closer to FBCLID7's flood protection levee that protects the New Territory community north of the levee. FBCLID7 engaged consulting engineers to assess the bank erosion and flood hazard risk and develop possible solutions to arrest the continued erosion and bank migration that could threaten the integrity of the flood protection levee.

As engineering solutions were developed, FBCLID7 initiated public outreach activities to inform New Territory residents and other interested parties of the potential flood risk and the possible engineering solutions. FBCLID7 organized meetings to present the issues to the public and solicit comments and input. During this timeframe, FBCLID7 developed a Hazard Mitigation Plan to assess hazards (primarily flooding hazards) and proposed mitigation actions that would reduce or avoid associated impacts. Meetings to discuss the potential flood hazards and the Hazard Mitigation Plan were held on March 1, 2018 and April 15, 2018. A community open house was held on April 24, 2018 to discuss proposed mitigation strategies. The draft Hazard Mitigation Plan was posted on FBCLID7's website (<http://www.fbclid7.com/news>) for public review. On May 15, 2018, a public meeting was conducted for all stakeholders and the public to provide comments. The Hazard Mitigation Plan was adopted on December 5, 2018. To remain eligible for federal funding relative to natural hazards, the plan must be updated every five years.

The public will be invited to review and comment on the proposed project and the Draft EA. A notice of availability to review the Draft EA will be posted in newspapers circulated in the region, including a Spanish language newspaper, and on FEMA's website (<https://www.fema.gov/emergency-managers/practitioners/environmental-historic/region/6>).

FEMA will consider the comments received and respond in the Final EA. If no substantive comments are received, the Draft EA will become final and a FONSI will be issued for the project.

6.3 Permits

The following are permits that would be required to implement the proposed project:

- USACE permit authorizing the discharge of fill material into jurisdictional waters of the United States (i.e., the Brazos River).
- Preparation of a SWPPP and coordination with the TCEQ for coverage under the CGP to construct the proposed project.
- Coordination with local floodplain administrator regarding the proposed project.

No easement would be required from the Texas General Land Office to proceed with the proposed project. No objection letters were received from the City of Sugar Land or Fort Bend County concerning this project.

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