Appendix B—Economics & Level 3 Economic Reevaluation Report

MORGANZA TO THE GULF OF MEXICO, LOUISIANA

ECONOMIC APPENDIX OUTLINE

PART 1: BACKGROUND INFORMATION

INTRODUCTION

General. This appendix presents the results of the economic analysis in support of a Level 3 Economic Update under Civil Works' Policy Memorandum (CWPM) 12-001 for the Morganza to the Gulf of Mexico, Louisiana (MTG) project and also serves to document the economics on the current design for the MTG project that is describe in the Engineering Documentation Report. The source of the previous authorized economic data is the document titled "Morganza to the Gulf of Mexico Louisiana Final Post-Authorization Change Report" dated May 2013 (hereafter referred to as 2013 PAC Report). The 2013 PAC Report was an update to the 2008 analysis, which determined that the Morganza to the Gulf project updated with the Hurricane and Storm Damage Risk Reduction System (HSDRRS) criteria would still be economically justified. The current design, described in the EDR, includes the incorporation of the adaptive design criteria as recommended in the Adaptive Criteria Assessment Report (ACAR) and other design refinements that have evolved since the PAC Report. Many of the descriptions in this appendix focus on the changes of the benefits from 2013 PAC Report to the current design.

This document was prepared in accordance with Engineering Regulation (ER) 1105-2-100, Planning Guidance Notebook, and ER 1105-2-101, Planning Guidance, Risk Analysis for Flood Damage Reduction Studies. The National Economic Development Procedures Manual for Flood Risk Management and Coastal Storm Risk Management, prepared by the Water Resources Support Center, Institute for Water Resources, was also used as a reference, along with the Users Manual for the Hydrologic Engineering Center Flood Damage Analysis Model and CWPM 12-001: Methodology for Updating Benefit-to-Cost Ratios (BCR) for Budget Development.

The economic appendix consists of a description of the methodology used to determine national economic development (NED) damages and benefits under existing and future conditions, projects costs, net benefits, and BCR. The evaluation reports benefits and costs at fiscal year (FY) 2022 price levels (October 2021). The proposed alternative was evaluated by comparing estimated equivalent annual benefits that would accrue to the study area with estimated average annual project costs. Equivalent annual benefits and average annual project costs were computed using a period of analysis of 50 years and the current FY 2022 Federal discount rate of 2.25 percent, as well as the Office of Management and Budget
(OMB) discount rate of 7 percent. The year in which significant benefits will accrue as a result of project construction is 2035. The alternative in the remainder of the appendix will be referred to as the 1 percent annual exceedance probability (AEP) alternative.

In addition to the NED account, two other project accounts have been used to evaluate the 1 percent AEP alternative: regional economic development (RED) and other social effects (OSE). Both of these accounts will be discussed in separate appendices.

NED Benefit Categories Considered. The NED procedure manuals for coastal and urban areas recognize four primary categories of benefits for flood risk management measures:

inundation reduction, intensification, location, and employment benefits. The majority of the benefits attributable to a project alternative generally result from the reduction of actual or potential damages caused by inundation. Inundation reduction, which is the only category of NED benefits addressed in this evaluation, includes the reduction of physical damages to structures, contents, and vehicles, avoidance of structure-raising costs, emergency cost reduction, agricultural benefits, water supply benefits, and safe harbor benefits. While all of these were calculated for the PAC report, only reduction of physical damages to structures, contents, and vehicles and emergency cost reduction were recalculated for this economic update. Avoidance of structure-raising costs, water supply benefits, and safe harbor benefits were all scaled from previous values to current values using the change in benefits to the recalculated categories. This scaling accounts for both changes in price level and interest rate, as well as changes in the with-project and without-project hydraulic conditions.

Physical Flood Damage Reduction. Physical flood damage reduction benefits include the decrease in potential damages to residential and commercial structures, their contents, and the privately owned vehicles associated with these structures. Inundation reduction benefits were considered under both existing and future conditions. Projections of the future development expected to place in the study area during the period of analysis were included as part of the future condition analysis in the PAC report, but were not included in this economic update due to development in many of those areas being actualized and consequently included in the current inventory as the existing condition.

At the time of the PAC report, partial storm surge risk reduction was expected to be provided before the base year of the project alternative, leading to inundation reduction benefits for residential and commercial structures, their contents, and vehicles being achieved during construction. In the PAC report, the benefits during construction were computed by comparing the expected without-project damages to the with-project damages receiving partial risk reduction beginning in the year 2024. It has been determined at the time of this economic update that the alternative will not produce benefits until initial project completion in 2035.

OMB survey forms were used to collect information on the value and placement of contents in the 24 industrial facilities located in the study area. The information from these surveys was used to develop the physical flood damage and benefits for these industrial properties. Additional information regarding the use of the OBM approved forms can be found in the final report dated May 2009 titled *Morganza to the Gulf Post Authorization Change Report: Residential and Nonresidential Structure Inventory and Nonresidential Surveys*.

Avoidance of Structure-Raising Costs. Typically, property owners in areas that incur repetitive flooding have three options for reducing their flood risk: raise their structures in place, floodproof/retrofit their structures, or relocate to other areas. For purposes of this evaluation, only structure-raising measures were considered. The avoidance of structure-raising costs for all residential and non-residential structures that would otherwise incur repetitive flooding is considered a benefit attributable to the 1 percent AEP alternative. The benefits captured for this category at the time of the PAC report were scaled for this economic update.

Emergency Cost Reduction Benefits. Emergency costs are those costs incurred by the community during and immediately following a major storm. They include the costs of emergency measures, such as evacuation and reoccupation activities conducted by local governments and homeowners, repair of streets, highways, and railroad tracks, and the subsequent cleanup and restoration of private, commercial, and public properties. In this evaluation, only the emergency cost reduction benefits associated with debris removal and cleanup, and the reduction of damages to major and secondary highways, streets, and railroads were considered.

Agricultural Benefits. NED agricultural benefits are defined as the increase in the value of the agricultural output of the area and the decrease in the cost of maintaining a given level of output attributable to a project alternative. These benefits include reductions in production costs and in associated costs, the reduction in damage costs from floods, erosion, sedimentation, inadequate drainage, or inadequate water supply, the value of increased production of crops, and the economic efficiency of increasing the production of crops in the project area.

Agricultural benefits have not been quantified and are not included in this appendix. Although the average annual agricultural acres inundated under without-project and with-project conditions were provided for the 1 percent AEP alternative in the PAC report, inundation mapping sufficient for the same level of detail was not done for this economic update and thus is not included.

Municipal Water Supply Benefits. The NED benefits from municipal water supply are defined as the willingness of a community to pay for an increase in the value of goods and services attributable to the water supply. In most cases, the marginal cost of supplying water is used to calculate the willingness of the consumers to pay for the additional water supply. However, because the marginal cost was not determined in this study, the water supply benefits were measured by comparing the reduction in the cost of treating water for municipal usage during periods of high salinity that is attributable to the 1 percent AEP alternative. The benefits captured for this category at the time of the PAC report were scaled for this economic update.

Safe Harbor Benefits for Large Recreational and Commercial Boat Fleets. The 1 percent AEP alternative reduces the risk of physical damage to large recreational and commercial boat fleet boats from the storm surges associated with minor storms, tropical storms, and hurricanes. The reduction in damages to large vessels and the reduction in the cost of moving the vessels to safer areas are considered benefits attributable to the 1 percent AEP alternative. However, only the reduction in travel costs was considered in this evaluation. The benefits captured for this category at the time of the PAC report were scaled for this economic update.

Regional Economic Development. The RED account has been addressed in a separate appendix to evaluate the 1 percent AEP alternative. If the economic activity lost in the

flooded region can be transferred to another area or region in the national economy, then these losses are not included in the NED account. However, the impacts on the employment, income, and output of the non-Federal or regional economy are considered part of the RED account. The USACE input-output macroeconomic Regional Economic System model (RECONS) Version 2 was used to address the impacts of the construction spending associated with the 1 percent AEP alternative on the regional economy.

Other Social Effects. The OSE account has been addressed in a separate appendix to evaluate the 1 percent AEP alternative. OSE focuses on the health and safety impacts that the project has on the local population.

DESCRIPTION OF THE STUDY AREA

Geographic Location. The study area, which is located in coastal Louisiana approximately 60 miles southwest of the City of New Orleans, includes all of Terrebonne Parish, the portion of Lafourche Parish to the south and west of Bayou Lafourche, and a small portion of southern Assumption Parish. Communities located within the study area include the City of Houma, the towns of Chauvin, Dulac, and Montegut in southern Terrebonne Parish, the towns of Donner and Gibson in western Terrebonne Parish, and the towns of Gray and Schriever in northern Terrebonne Parish. Also included are the towns of Raceland, Lockport, and Pointe aux Chenes in Lafourche Parish and the portion of the City of Thibodaux south of Bayou Lafourche. The Gulf Intracoastal Waterway (GIWW) passes through the northern part of the study area in an east-west direction, and the Houma Navigation Channel (HNC) extends due south from Houma to the Gulf of Mexico. The southern extent of the study area is the alignment for the proposed hurricane protection structure that would cross the southern part of Terrebonne Parish in an east-west direction. At the time of the PAC report, the Morganza evaluation area was divided into 276 unique hydrologic reaches to enable an economic analysis of the project alternative through the use of the HEC-FDA certified model. However, an inventory of residential and non-residential structures was only assembled in the 266 study area reaches that could be impacted by storm surges under the without-project condition. The two reaches added to the economic analysis since the time of the PAC report are located on the eastern extent of the study area between Lockport and Larose. These reaches are highlighted in Figure 1 below.

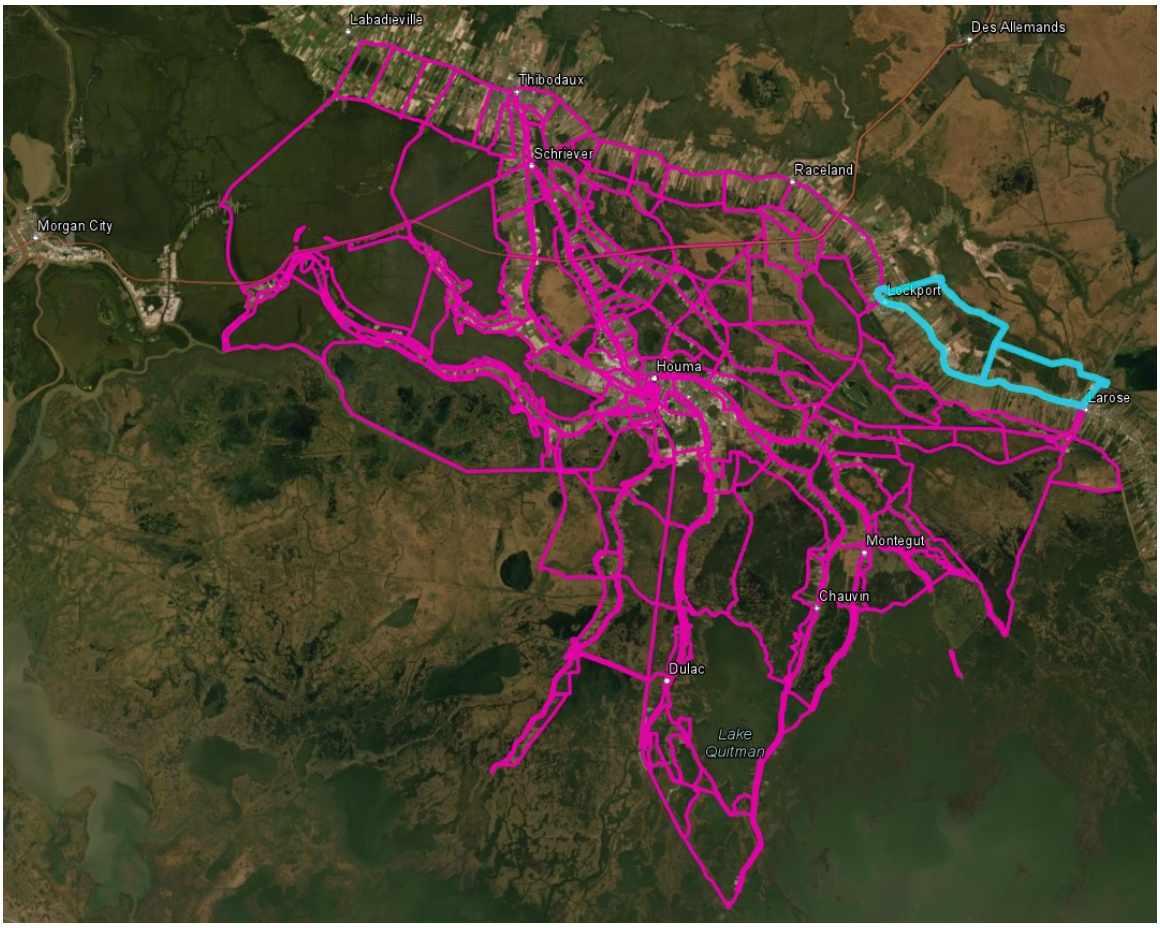

Figure 1 - Study Area Reaches

Land Use. The total number of acres of developed land, agricultural land, undeveloped land, and open water included in the study area as of the year 2020 is shown in Table 1. As shown in the table, approximately 11 percent of the study area is currently developed and approximately 17 percent of the study area is being used as agricultural land. Over 70 percent of the study area is categorized as either wetland or open water, which leaves a very small percentage of the study area available for future development.

Table 1
Morganza to the Gulf Economic Update
Land Use in the Study Area

Land Class Name	Acres	Percentage of Total
Developed Land	**53,047**	**11.0%**
Low Intensity	31,311	6.5%
Open Space	10,537	2.2%
Medium Intensity	7,242	1.5%
High Intensity	3,957	0.8%
Agricultural Land	**82,405**	**17.0%**
Grass/Pasture	46,001	9.5%
Sugarcane	23,290	4.8%
Fallow/Idle Cropland	12,481	2.6%
Soybeans	473	0.1%
Miscellaneous Agricult	160	0.0%
Undeveloped Land	**294,086**	**60.8%**
Herbaceous Wetlands	155,066	32.1%
Woody Wetlands	137,894	28.5%
Mixed Forest	354	0.1%
Shrubland	272	0.1%
Barren	245	0.1%
Evergreen Forest	133	0.0%
Deciduous Forest	122	0.0%
Open Water	**53,996**	**11.2%**
Total	**483,534**	**100.0%**

Source: National Agricultural Statistical Service 2020
Note: "Miscellaneous Agriculture" is all agricultural categories that account for less than 0.1% of the study area

SOCIOECONOMIC SETTING

Population and Number of Households. Tables 2 and 3 display the Census population and number of households in each of the parishes for the years 1970, 1980, 1990, 2000, ,

and 2010; American Community Survey estimates for the years 2015 and 2019; as well as projections for the years 2035 and 2085. Projections are provided by the Moody's County Forecast Database to the year 2046. Moody's projections were extended by New Orleans District from the year 2046 to the year 2085.

Table 2
Morganza to the Gulf Economic Update
Historical and Projected Parish Population
(Thousands)

Parish	1970	1980	1990	2000	2010	2015	2019	2035	2085
Assumption	19.7	22.2	22.7	23.3	23.4	23.1	22.5	22.0	19.3
Lafourche	69.1	83.5	85.8	90.0	96.7	97.5	98.1	99.4	104.2
Terrebonne	76.2	95.1	97.0	104.5	111.5	112.7	112.1	115.7	123.9
Total	165.0	200.8	205.5	217.8	231.6	233.3	232.6	237.1	247.4

Source: U.S. Census Bureau (BOC); American Community Survey (ACS); Moody's Analytics (ECCA) Forecast

Table 3
Morganza to the Gulf Economic Update
Number of Households by Parish
(Thousands)

Parish	1970	1980	1990	2000	2010	2015	2019	2035	2085
Assumption	5.0	6.5	7.4	8.2	8.7	10.5	10.8	9.2	10.0
Lafourche	18.0	25.7	28.8	32.1	35.7	39.4	41.1	40.8	51.1
Terrebonne	19.6	29.5	31.9	36.0	40.0	44.4	45.4	46.3	58.9
Total	42.6	61.7	68.1	76.3	84.4	94.3	97.3	96.3	120.1

Source: U.S. Census Bureau (BOC); American Community Survey (ACS); Moody's Analytics (ECCA) Forecast

While Assumption Parish is forecasted to experience a slight decline in population, the populations of the two main parishes of the study area are both expected to increase with the overall study area seeing a population increase throughout the life of the project. All parishes within the study area are projected to experience an increase in number of households over the life of the project. More information about the population and number of households can be found in the OSE Appendix.

Income. Table 4 shows the per capita personal income levels in each parish for the years 1990, 2000, 2010, and 2015 through 2019, the year with the latest available data.

Table 4
Morganza to the Gulf Economic Update
Per Capita Personal Income
($ Dollars)

Parish	1990	2000	2010	2015	2016	2017	2018	2019
Assumption	12,146	19,765	33,641	41,467	39,971	43,542	46,833	47,947
Lafourche	13,376	23,760	40,455	45,366	42,683	44,034	44,316	45,806
Terrebonne	13,415	20,962	38,418	42,223	39,116	39,511	41,058	42,267

Source: Bureau of Economic Analysis

As shown in the table, all parishes experienced a steady increase in per capita income between 1990 and 2015. The growth in per capita income during this time reflects the increased oil and gas exploration and production activities in the Gulf of Mexico, and the improvement in the economy of the state. Between 2015 and 2016, however, the parishes experienced a slight decline in per capita income, which is likely a result of the oil price-driven recession experienced during this time. The decline is followed by a fairly slow recovery through 2019.

Employment. Table 5 shows the total non-farm employment by parish for the years 1970, 1980, 1990, 2000, 2010, 2015, and projections for the years 2035 and 2085. The employment projections were based on the Moody's County Forecast Database and extended from the year 2046 to the year 2085 by New Orleans District based on the growth rate forecasted by Moody's. More information about employment can be found in the OSE Appendix.

Table 5
Morganza to the Gulf Economic Update
Total Non-Farm Employment
(Thousands)

Parish	1970	1980	1990	2000	2010	2015	2035	2085
Assumption	4.7	7.6	5.9	5.3	4.5	4.4	4.5	5.6
Lafourche	15.1	24.4	22.1	30.4	37.5	38.5	34.9	38.9
Terrebonne	24.6	42.4	35.8	47.3	54.9	58.6	53.4	60.0
Total	44.4	74.4	63.8	83.0	96.9	101.5	92.9	104.5

Source: U.S. Bureau of Labor Statistics: Census of Employment & Wages (QCEW - ES202); Moody's Analytics (ECCA) Forecast

Compliance with Policy Guidance Letter (PGL) 25 and Executive Order (EO) 11988. Given the growth trends in employment and income, it is expected that development will continue to occur in the study area with or without the storm surge risk reduction system. The project will not conflict with PGL 25 and EO 11988, which state that the primary objective of a flood risk reduction project is to protect existing development rather than make undeveloped land available for more valuable uses. The project will not induce development, but it will reduce the risk of the population being displaced after a major storm event.

RECENT FLOOD HISTORY

Tropical Flood Events. While the study area has periodically experienced localized flooding from excessive rainfall events, the primary cause of the flood events that have taken place in the study area has been the tidal surges from hurricanes and tropical storms. Figure 2 shows the 64 hurricane and tropical storm tracks on record that have come within 50 miles of the City of Houma, located near the center of the study area.

Figure 2 – NOAA Historical Hurricane and Storm Tracks

During the past 35 years, coastal Louisiana has been impacted by several major tropical events. In 2020 alone, the Louisiana coast experienced four hurricanes and one tropical

storm landfall. Though not all of these storms tracked directly through the study area, the tidal surges associated with these storm events inundated structures and resulted in billions of dollars in damages to coastal Louisiana. On August 29, 2021, during the writing of this document, the study area was severely impacted by Hurricane Ida

Table 6 provides a summary of the total FEMA flood claims paid to all Louisiana policy holders as a result of tropical events. The table includes the number of paid losses, the total amount paid, and the average amount paid on each loss. The total and average paid losses have been converted to reflect 2022 price levels. The table only includes losses that were covered by flood insurance.

Table 6
Morganza to the Gulf Economic Update
FEMA Flood Claims in Louisiana

Event	Year	Number of Paid Claims	Total Amount Paid ($ Millions)	Average Amount Paid ($ Thousands)
Tropical Storm Juan	Oct-85	6,187	$252	$41
Hurricane Andrew	Aug-92	5,589	$359	$64
Tropical Storm Isadore	Sep-02	8,441	$188	$22
Hurricane Lili	Oct-02	2,563	$61	$24
Hurricane Katrina	Aug-05	167,099	$24,583	$147
Hurricane Rita	Sep-05	9,507	$714	$75
Hurricane Gustav	Sep-08	4,524	$153	$34
Hurricane Ike	Sep-08	46,137	$3,594	$78
Tropical Storm Bonnie	Jul-10	1,022	$6	$6
Hurricane Isaac	Aug-12	13,493	$861	$64
Tropical Storm Olga	Oct-19	9,544	$87	$9

Source: Federal Emergency Management Agency (FEMA), National Hurricane Center (NHC)

Notes: Total amount paid and average amount paid have been updated reflect FY22 price levels. Data from recent events in 2020 and 2021 are not yet available.

The following is a summary of eight of the major tropical events and their effects on the two-parish area and coastal Louisiana.

Hurricane Juan. Hurricane Juan caused extensive flooding throughout southern Louisiana due to its prolonged 5-day movement back and forth along the Louisiana coast. Rainfall totals in the area ranged from 5 inches to almost 17 inches. The storm was responsible for storm surges of 5 to 8 feet and tides of 3 to 6 feet above normal.

According to FEMA officials, the estimated value of the residential and commercial damage and public assistance throughout coastal Louisiana totaled $112.5 million.

Over 800 homes were inundated in the coastal portion of Terrebonne Parish south of the City of Houma. Scattered pockets of flooding were also reported in the portions of Terrebonne and Lafourche Parishes north of Houma. Approximately 40 percent of the homes in the coastal areas of Lafourche Parish, including Pointe aux Chenes, were also inundated by the high tides.

Agricultural damages from the storm totaled $175 million, with 24 percent of these damages occurring in the two-parish study area. The soybean crop suffered over half of the agricultural damage, while the sugar cane crop incurred 20 percent of the damage. Excessive rains and storm surge oversaturated the fields and caused a reduction in crop yields. The saturated fields also made it easier for the winds to topple over the cane stalks.

Hurricane Andrew. On August 26, 1992, Hurricane Andrew made landfall in St. Mary Parish, 80 miles west of Morgan City. FEMA reported that over 2,000 flood claims were filed as a result of the storm in Louisiana. These claims had a total value of over $25 million. Over 90 percent of this flood damage occurred in the Terrebonne Parish communities south of Houma, where up to six feet of water was reported. Only minor flooding in the back parts of subdivisions was reported in the City of Houma and in the areas north of the city. The unleveed portion of Lafourche Parish along its border with Terrebonne Parish, which includes the community of Pointe aux Chenes, also incurred extensive flood damage. However, most of the agricultural damage in the area occurred as the result of wind damage to the sugar cane crop.

Tropical Storm Isidore and Hurricane Lili. On October 3, 2002, one week after Tropical Storm Isidore affected the southeastern and south central coastal areas of Louisiana, Hurricane Lili made landfall on the western edge of Vermilion Bay, south of the cities of Abbeville and New Iberia, as a weak category 2 hurricane. The high winds caused tidal flooding in the communities east of the eye of the storm. The ridge communities in Terrebonne Parish south of the city of Houma, including Cocodrie, Dulac, Isle de Jean Charles, and Montegut, and the community of Pointe aux Chenes in Lafourche Parish, were affected by tidal flooding. The only community south of Houma that did not flood was Chauvin.

Insured flood losses from Tropical Storm Isidore and Hurricane Lili totaled nearly $600 million. Approximately $105 million of insured losses were related to Tropical Storm Isidore, while Hurricane Lili caused $471 million of insured losses. According to windshield surveys conducted by the American Red Cross, approximately 10,000 residential structures were damaged by winds and storm surges of the two storms. These surveys included both insured and uninsured structures. Tropical Storm Isidore caused damage to 2,905 structures, while Hurricane Lili caused damage to 7,356 structures.

In a revised report released in mid-November by the Louisiana State University Agricultural Center (LSU AgCenter), the estimated agricultural damages caused by Tropical Storm Isidore and Hurricane Lili totaled $454.3 million. This estimate also includes the agricultural damages caused by the continuation of rain during the month of October, which delayed the harvesting of crops. The excessive rains and storm surge flooded the agricultural fields and increased the harvest costs.

The wind and waves of Tropical Storm Isidore and Hurricane Lili caused extensive beach erosion in the barrier islands of Louisiana. These islands protect the Louisiana coastline from storm surges and provide a natural habitat for many species of wildlife. The barrier islands west of the mouth of the Mississippi River that were affected by the two storm events include the Isles Dernieres (Whiskey Bayou, Raccoon Island, Trinity Island, and East Island), Timbalier Island, East Timbalier Island, Elmer Island, and Grand Terre. Grand Isle incurred extensive damage along its eastern beach. Three small islands east of the mouth of the Mississippi River, Grand Gosier Island, Curlew Island, and Chandeleur Island, incurred extensive damage and beach erosion. A monetary value has not been determined for these environmental damages.

Hurricane Katrina. On August 29, 2005, Hurricane Katrina made landfall near the town of Buras in Plaquemines Parish about 50 miles east of coastal Lafourche and Terrebonne Parishes. While it entered as a category 3 storm with winds in excess of 120 mile per hour, its storm surge of approximately 30 feet was more characteristic of a Category 5 hurricane. The majority of the damages from Hurricane Katrina occurred outside of the Morganza study area. However, if the hurricane had taken a more westerly track, the Houma area could have experienced the same magnitude of flooding as the City of New Orleans.

According to the Department of Health and Hospitals, approximately 1,400 deaths were reported following Hurricane Katrina. Approximately 1.3 million residents were displaced immediately following the storm, and 900,000 residents remained displaced as of October 5, 2005. According to the Louisiana Recovery Authority (LRA), two years after the storm, approximately 210,000 FEMA applicants still had out-of-state mailing addresses, while 230,000 FEMA applicants had an in-state mailing address in a different zip code.

The storm caused more than $40.6 billion of insured losses to the homes, businesses, and vehicles in six states. Approximately two thirds of these losses, or $25.3 billion, occurred in Louisiana based on data obtained from the Insurance Information Institute. According to the LRA, approximately 150,000 housing units were damaged, and according to the Department of Environmental Quality, 350,000 vehicles, and 60,000 fishing and recreational vessels were damaged.

The storm surge from Hurricane Katrina inundated marshes and farmland throughout the coastal area, including Terrebonne and Lafourche Parishes. According to the LSU AgCenter, agricultural losses totaled approximately $825 million. The agricultural

resources impacted by the storm include sugarcane, cotton, rice, soybeans, timber, pecans, citrus, and livestock. The losses to aquaculture (crawfish, alligators, and turtles), fisheries (shrimp, oysters, and menhaden), and wildlife and recreational resources totaled approximately $175 million.

Hurricane Rita. The hurricane made landfall along the Texas-Louisiana border on September 24, 2005, as a category 3 storm with winds in excess of 120 miles per hour. As the hurricane passed south of the study area, its high winds pushed water north into coastal Lafourche and Terrebonne Parishes. A storm surge of approximately 15 - 20 feet affected coastal Louisiana from Terrebonne Parish to the Texas border. With estimated insured losses of approximately $3 billion, Hurricane Rita became one of the costliest natural disasters in U.S. history.

Approximately 2,000 square miles of farmland and marshes throughout the coastal area were inundated. According to the LSU AgCenter, agricultural losses totaled approximately $490 million. The agricultural resources impacted by the storm include sugarcane, cotton, rice, soybeans, timber, pecans, citrus, and livestock. The losses to aquaculture (crawfish, alligators, and turtles), fisheries (shrimp, oysters, and menhaden), and wildlife and recreational resources totaled approximately $100 million.

Hurricanes Gustav and Ike. On September 1, 2008, almost three years after Hurricane Katrina, Hurricane Gustav made landfall near Cocodrie in Terrebonne Parish as a strong category 2 hurricane. It followed a northwest path into central Louisiana, and most of the damages caused by the storm resulted from its high winds and heavy rain. Coastal flooding occurred in the low-lying areas of Jefferson and Lafourche Parishes and the coastal areas of Terrebonne Parish south of the City of Houma.

Nearly 2 million residents of south Louisiana evacuated in the days before Gustav made landfall. Louisiana officials reported that emergency spending totaled approximately $500 million, which included $210 million for state agencies, $48 million for deploying the National Guard, $13.5 million for general evacuation shelters, $3 million for special-needs medical shelters, $6.1 million for transporting the medical needy, $21 million for costs of contraflow and evacuation from coastal communities and other areas, $20 million in special generators to open ice plants, pharmacies and service stations throughout the impacted areas, $5 million for state-purchased fuel, $19.7 million for ready-to-eat meals, $5.3 million for ice, and $2.5 million for water supplies. The State Department of Transportation estimated that it cost approximately $50 million to remove 1.5 million cubic yards of debris, and approximately $20 million to repair draw bridges.

Almost two weeks later, on September 12 and 13, the Louisiana coastal region incurred additional flood damages as Hurricane Ike moved along the Louisiana coast. According to estimates from the state officials, approximately 12,000 homes and businesses were flooded by the two storms. Approximately 2,500 buildings in Terrebonne Parish, south of the City of Houma, incurred flood damages from Hurricane Ike.

The LSU AgCenter estimated that potential lost revenues and damages to the infrastructure of the agriculture, forestry, and fisheries industries in Louisiana resulting from the two hurricanes totaled approximately $959 million. The storm surge primarily affected the cattle, rice, soybeans, and sugarcane.

Hurricane Ida. On August 29, 2021, Hurricane Ida made landfall near Port Fourchon in Lafourche Parish as a major Category 4 hurricane with sustained wind speeds of 150 mph and a central pressure of 930 millibars. The storm held a Category 4 status for four hours after landfall until weakening into Category 3 status for the subsequent four hours. The hurricane hovered over Louisiana for sixteen hours before moving North into Mississippi. Figure 3 below, developed by Dan Swenson for the local news source The New Orleans Advocate, shows the path of the storm with some snapshots of areas impacted.

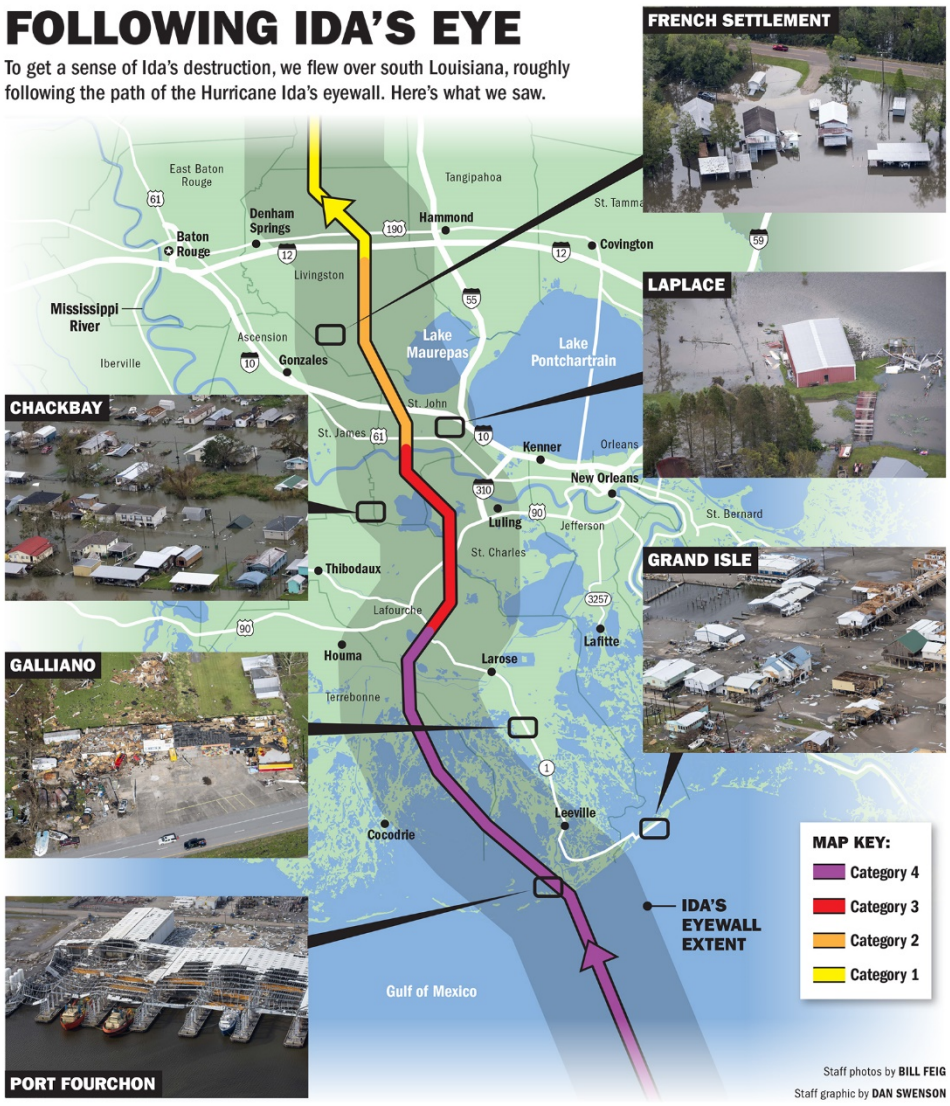

Figure 3 – Path of Hurricane Ida with Aerial Photography of Impacted Areas

Within the state of Louisiana, Hurricane Ida caused the deaths of at least 29 people and inflicted an estimated $27 billion to $40 billion in damages in both insured and uninsured losses by the end of September 2021. These damages are from wind, storm surge and inland flooding for residential and commercial properties. Many of the deaths are attributed to the excessive heat during extended power outages and generator-related deaths. Additionally, over a million residents lost power throughout the state. Post-storm analysis and recovery efforts are currently ongoing as of the writing of this report, but FEMA has paid $493 million in claims as of November 23, 2021.

SCOPE OF THE STUDY

Problem Description. The study area is characterized by low, flat terrain with ridges surrounding the waterways. The terrain has made the area highly susceptible to flooding from the tidal surges of hurricanes and tropical storms. The apparent subsidence, or relative sea level rise, that has been taking place in the Morganza study area is expected to magnify the flooding problems in the future. While the Terrebonne Levee and Conservation District is currently maintaining a system of forced drainage levees, pump stations, and flood control structures for Terrebonne Parish, an adequate overall storm surge risk reduction system is not currently available for the entire study area.

Project Alternative. As part of the 2002 Morganza to the Gulf, Louisiana Feasibility Report, a project alignment was selected and later authorized to provide storm surge risk reduction for portions of Terrebonne and Lafourche Parishes. The authorized alignment was designed to contain the pre-Katrina surge elevations associated with the 1 percent (100-year) AEP storm surge risk reduction system, and the costs were provided in 2002 price levels. Since that time, the hydrology, project design criteria, and implementation costs have changed. A revised project cost estimate (RPCE) report was developed in 2008 using post-Katrina design criteria and water surface profiles for the 1 percent (100-year) AEP storm surge risk reduction system. This alignment involves the construction of new earthen levees that would run parallel to Louisiana Highway 57 south of Lake Boudreaux and north of the Falgout Canal and would connect to existing forced drainage levees. The levees will be used in conjunction with flood risk management and environmental structures and would minimize the adverse impacts to the environment, local interests, navigation, and industry. Finally, construction of a lock structure on the HNC south of Bayou Grand Caillou has been included as part of the system. In this document, “the 1 percent AEP alternative” refers to the alignment using post-Katrina HSDRRS design criteria, which is the selected and authorized project alternative for the Morganza to the Gulf study.

PART 2: ECONOMIC AND ENGINEERING INPUTS TO THE HEC-FDA MODEL

HEC-FDA MODEL

Model Overview. The Hydrologic Engineering Center Flood Damage Analysis (HEC-FDA) Version 1.4.2 Corps-certified model was used to calculate the damages and benefits for the Morganza evaluation. The economic and engineering inputs necessary for the model to calculate damages for the project base year (2035) and the final year in the period of analysis (2084) are described in this section of the report. The economic inputs include structure inventory, contents-to-structure value ratios, vehicles, first floor elevations, and depth-damage relationships. The engineering inputs include ground elevations, exterior and interior relationships, local levee performance, and Federal levee performance.

The uncertainty surrounding each of the economic and engineering variables was also entered into the model. Either a normal probability distribution, with a mean value and a standard deviation, or a triangular probability distribution, with a most likely, a maximum and a minimum value, was entered into the model to quantify the uncertainty associated with the key economic variables. A normal probability distribution was entered into the model to quantify the uncertainty surrounding the ground elevations. The number of years that stages were recorded at a given gage was entered for each study area reach to quantify the hydrologic uncertainty or error surrounding the stage-probability relationships. The uncertainty associated with the levee performance was quantified using the levee features section of the model, which related the elevation of exterior storm surges to the probability of levee failure.

ECONOMIC INPUTS TO THE HEC-FDA MODEL

Structure Inventory. The structure inventory used in this economic update is comprised of both the inventory from the PAC report with values indexed to reflect the current FY21 price level, hereafter referred to as the "original inventory", as well as a supplemental inventory that incorporates new development since the initial creation of the original inventory. As the team was not able to develop this supplemental inventory with the same level of detail as the original inventory, statistics from the original inventory were captured and applied to incorporate more site-specific information.

Original Inventory. Field surveys were conducted in 2009 to develop a residential and non-residential structure inventory for the economic analysis. The areas to be inventoried had been selected in 2008 based on estimates of surge elevations for this area developed as part of the Louisiana Coastal Protection and Restoration (LACPR) evaluation. Based on the structural information collected during the field surveys, the Marshall and Swift

Valuation Service was used to calculate a depreciated replacement cost for all residential and non-residential structures in the study area reaches. The inventoried structures were classified as one of 14 structure types: residential one-story with slab or pier foundation, residential two-story with slab or pier foundation, mobile home, eating and recreation, grocery and gas station, multi-family residence, professional building, public and semi-public building, repairs and home use establishment, retail and personal services building, and warehouse, and contractor services building. The inventory also included 24 industrial structures that were inventoried using OMB approved interview forms. At the time of the PAC report, these industrial structures were analyzed using a separate HEC-FDA model. For this economic update, these industrial structures and their corresponding depth-damage functions were included in the HEC-FDA model for residential and non-residential structures using the category indicator "IND_S". All values associated with the original inventory were first indexed using RSMeans Historical Cost Index to represent a FY21 price level and then indexed using the Consumer Price Index (CPI) less food and energy to represent a FY22 price level. The points for the 51,606 structures in the original inventory are shown in Figure 4.

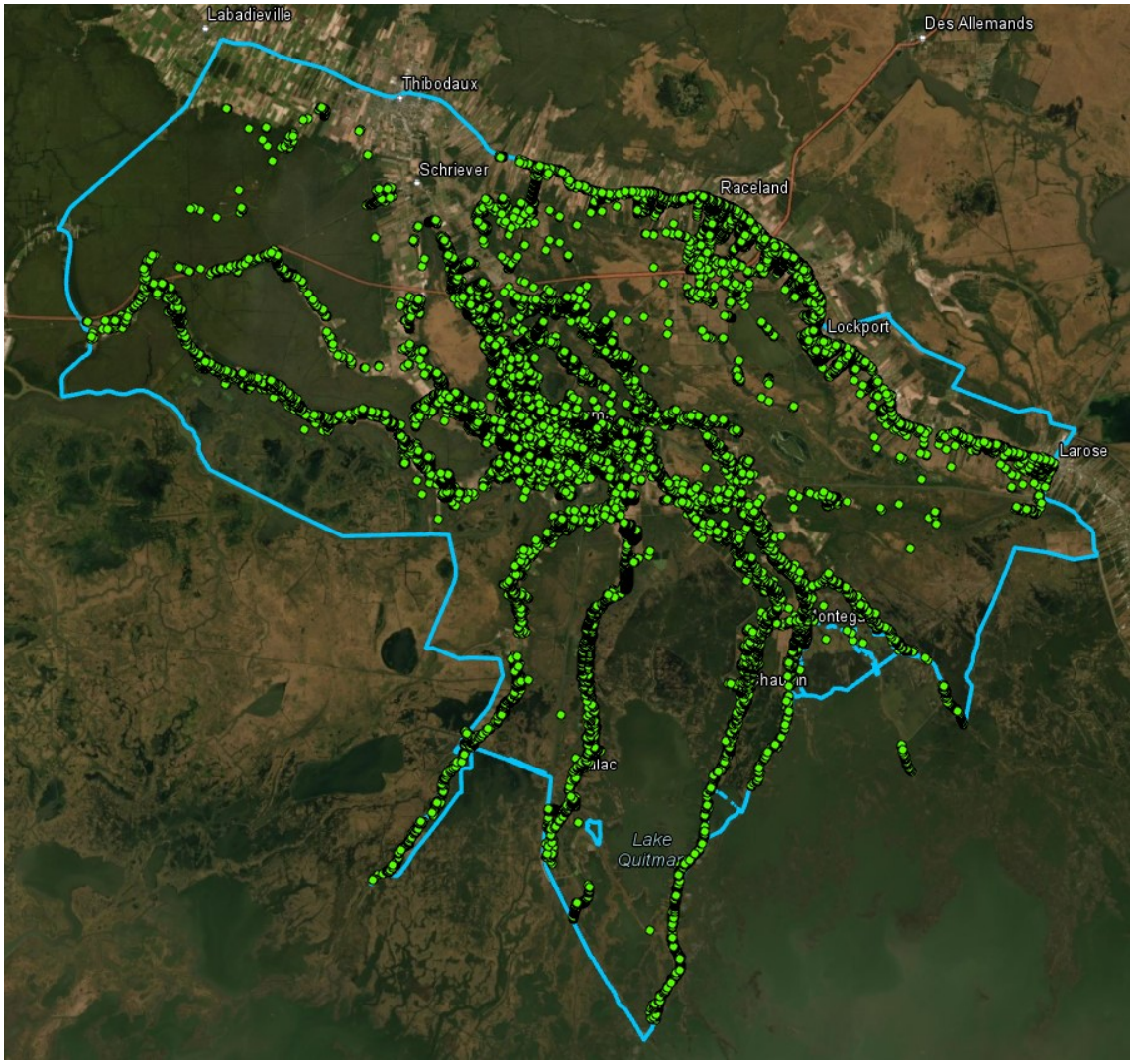

Figure 4 – Original Inventory Points

Supplemental Inventory. The original inventory was supplemented with additional structure points to represent newer development not previously accounted for while conducting the windshield surveys or development that occurred after the original windshield surveys. These supplemental structures were added from either the National Structure Inventory (NSI) Version 2 or were manually added using aerial imagery. As the NSI provides information about occupancy type, that information was leveraged to assign a corresponding occupancy used in the original inventory. For manually added points, Google Street View was used to determine which occupancy used in the original inventory best fit the point. Square footage statistics were calculated from the original inventory by occupancy type and reach and applied to the supplemental inventory. These square footages were then used to assign depreciated replacement values using RSMeans Square Foot Costs. The points for the 15,928 structures in the supplemental inventory are shown in Figure 5. The vast majority (about 68 percent) of the supplemental inventory is in the northern portion of the study area near Thibodaux, which is protected by local levees and was previously expected to not experience damages with or without project.

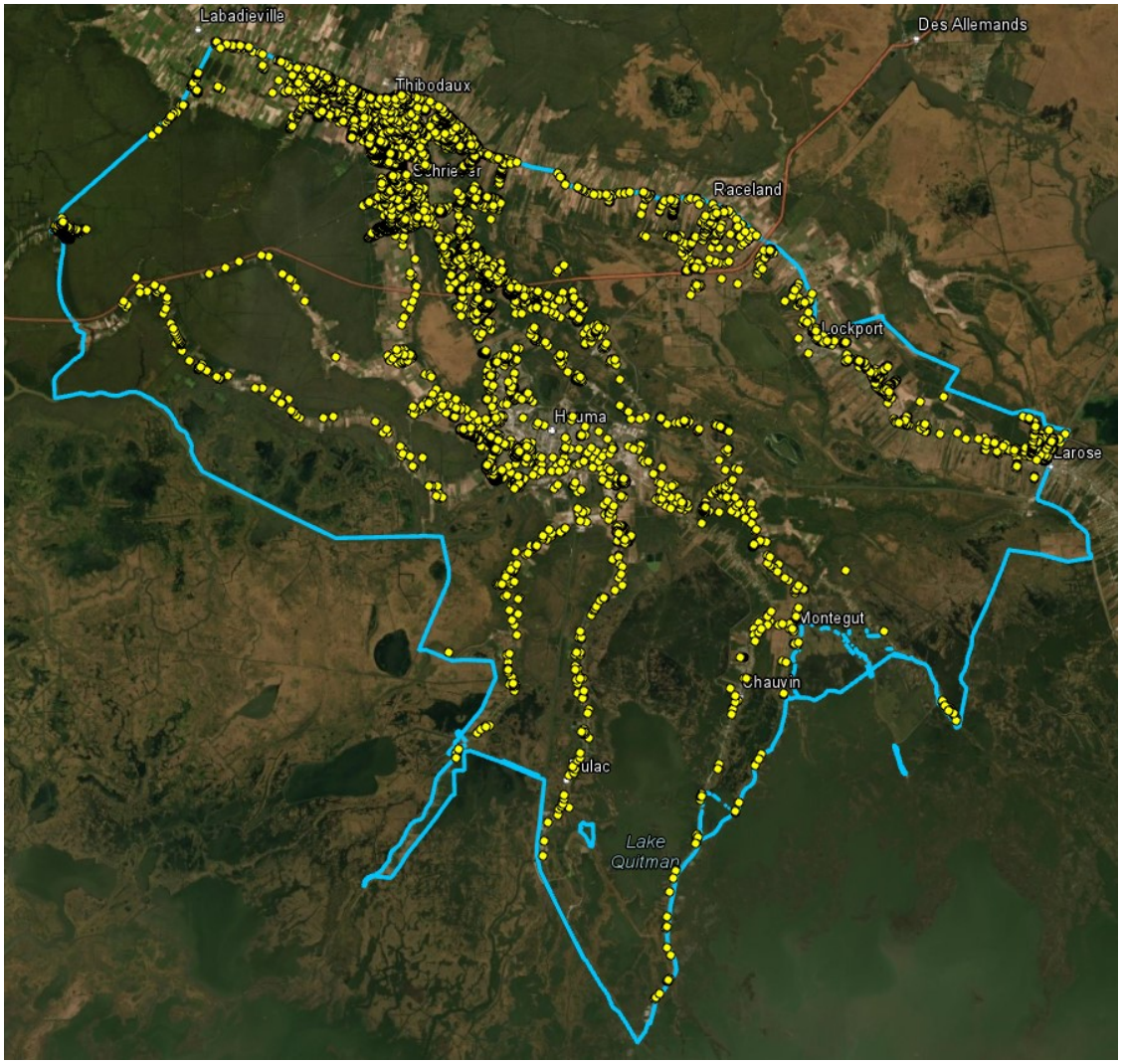

Figure 5 – Supplemental Inventory Points

Table 7 shows the total number of structures by category and vehicles in each study area reach. Due to size, the tables have been added at the end of this appendix. Table 8 displays the number of structures and vehicles by occupancy type, as well as the average depreciated replacement value.

Table 8
Morganza to the Gulf Economic Update
Residential, Non-Residential, and Vehicle Inventory
(2022 Price Level)

Structure Occupancy	HEC-FDA Occupancy Name	Number of Structures	Total Depreciated Replacement Value ($ Millions)	Average Depreciated Replacement Value ($ Thousands)
Residential				
One-Story Slab	1STY-SLAB	27,618	$6,520	$236
One-Story Pier	1STY-PIER	15,435	$2,159	$140
Two-Story Slab	2STY-SLAB	3,640	$1,083	$297
Two-Story Pier	2STY-PIER	1,516	$315	$208
Mobile Home	MOBHOM	12,607	$218	$17
Total Residential		**60,816**	**$10,294**	**$169**
Non-Residential				
Eating and Recreation	EAT	387	$196	$506
Professional	PROF	1,503	$1,320	$878
Public and Semi-Public	PUBL	779	$949	$1,219
Repair and Home Use	REPA	276	$117	$424
Retail and Personal Services	RETA	744	$649	$872
Warehouse	WARE	3,220	$1,018	$316
Grocery and Gas Station	GROC	144	$79	$546
Multi-Family Occupancy	MULT	410	$325	$792
Interviewed Industrial	IND_S	24	$67	$2,790
Total Non-Residential		**7,487**	**$4,720**	**$630**
Vehicles				
Autos	AUTO	70,846	$853	$12

Note: "Interviewed Industrial" is a category, not an occupancy in HEC-FDA

Future Development. At the time of the PAC report, projections were made of the future residential and non-residential development to take place in the Morganza study area under without-project conditions. Much of the undeveloped land within the study area reaches where this development was projected has already been developed at the time of this report, so no additional projection of future development was included in this economic update.

Residential and Non-Residential Content-to-Structure Value Ratios (CSVR). Onsite interviews were conducted with the owners of a sample of ten structures from each of the three residential content categories (30 residential structures) and each of the eight non-residential content categories (80 non-residential structures). A CSVR was computed for each residential and non-residential structure in the sample based on the total depreciated content value developed from the surveys. An average CSVR for each of the five residential structure categories and nine commercial structure classifications was calculated as the average of the individual structure CSVRs.

Since only a limited number of field surveys were conducted for each of the residential and non-residential content categories, statistical bootstrapping was performed to address the potential error in estimating the mean and standard deviation CSVR values. Statistical bootstrapping is a method that uses re-sampling with replacement to improve the estimate of a population statistic when the sample size is insufficient for straightforward statistical inference. The bootstrapping method has the effect of increasing the sample size. Thus, bootstrapping provides a way to account for the distortions caused by the specific sample that may not be fully representative of the population.

With use of the @Risk software, a simulation using 100,000 iterations was executed for each content category. Within each iteration, a new ten-observation sample with replacement, called a bootstrap sample, was taken from the original sample of ten observations. Each observation within the original sample was given a uniform probability or chance of being selected as each one of the ten values within the bootstrap sample. The @Risk spreadsheet calculated a mean value and a standard deviation for each of the bootstrap samples, and then calculated a mean value for all of the bootstrap means and mean value of all the standard deviations.

Table 9 shows the CSVRs and standard deviations for each of the residential and non-residential structure categories derived using the statistical bootstrapping technique. The CSVRs and standard deviations were used in the HEC-FDA model, along with the depth-damage relationships, to calculate flood damages for residential and non-residential structures. A unique CSVR was developed for each of the 24 industrial structures in the study area based on the content values provided by the owners of the properties using OMB-approved interview forms.

Table 9
Morganza to the Gulf Economic Update
Content-to-Structure Value Ratios (CSVRs) and Standard Deviations (SDs)

Structure Category	Structure Occupancy	FDA Occupancy	CSVR %	SD %
Residential	One-Story Single Family	1STY-	71	23
	Two-Story Single Family	2STY-	50	27
	Mobile Home	MOBHOM	148	68
Non-Residential	Eating and Recreation	EAT	305	448
	Grocery and Gas Station	GROC	128	96
	Professional	PROF	78	70
	Public and Semi-Public	PUBL	81	103
	Multi-Family	MULT	23	13
	Repair and Home Use	REPA	251	208
	Retail and Personal Services	RETA	148	113
	Warehouse	WARE	373	481
Interviewed Industrial	Gulf	Gulf	573	0
	Benoit	Benoit	2,356	0
	Prison	Prison	72	0
	Juvy	Juvy	115	0
	CandiesB	CandiesB	738	0
	CandiesA	CandiesA	6,292	0
	WeatherfordE	WeatherfordE	853	0
	ChabertA	ChabertA	111	0
	ChabertB	ChabertB	1,930	0
	ERA	ERA	8,113	0
	EBI	EBI	41	0
	WeatherfordA	WeatherfordA	73	0
	WeatherfordB	WeatherfordB	993	0
	WeatherfordF	WeatherfordF	117	0
	WeatherfordC	WeatherfordC	1,282	0
	WeatherfordD	WeatherfordD	72	0
	Oilstates	Oilstates	339	0
	Caillou	Caillou	478	0
	ApacheC	ApacheC	4	0
	ApacheA	ApacheA	23	0
	ApacheB	ApacheB	15	0
	Hercules	Hercules	18,686	0
	Chauvinbros	Chauvinbros	25	0
	Thomasea	Thomasea	4,774	0

Vehicle Inventory. Based on 2012-2016 American Community Survey data for the evaluation area, it was determined that there are an average of 1.73 vehicles associated with each household (owner occupied housing or rental unit). According to the Southeast Louisiana Evacuation Behavioral Report published in 2006 following Hurricanes Katrina and Rita, approximately 70 percent of privately owned vehicles are used for evacuation during storm events. The remaining 30 percent of the privately owned vehicles remain parked at the residences and are subject to flood damages. According to the 2019 Edmunds Used Vehicle Report, the average value of a used car was $22,095 (FY21 price level). Because only those vehicles not used for evacuation can be included in the damage calculations, an adjusted average vehicle value of $11,470 ($22,095 x 1.73 x 0.30) was assigned to each individual residential automobile structure record in the HEC-FDA model. If an individual structure contained more than one housing unit, then the adjusted vehicle value was assigned to each housing unit in a residential or multi-family structure category. Only vehicles associated with residential structures were included in the analysis. Finally, every apartment building was assumed to contain 25 units, so each apartment's vehicle record was assigned a structure count of 25. All vehicle values were indexed using the CPI to represent an FY22 value.

First Floor Elevations and Elevation of Vehicles. Topographical data obtained from the Light Detection and Ranging (LIDAR) digital elevation model (DEM) using the North American Vertical Datum of 1988 (NAVD88 epoch 2004.65) were used to determine ground elevations. For the creation of the original inventory, field survey teams estimated the height of each residential and non-residential structure above the ground using hand levels. The ground elevation was added to the height of the foundation of the structure above the ground to determine the first floor elevation of the structure. Vehicles were assigned to the ground elevation of the adjacent residential structures.

For this economic update, the inventory from the PAC Report was updated to use ground stage and foundation height instead of one first floor elevation. The supplemental inventory was assigned ground stages using the same LiDAR DEM as was used in the original inventory and the engineering inputs. Foundation height statistics were computed by reach and occupancy type from the original inventory and applied to the supplemental inventory. If statistics were not available for a certain reach and occupancy combination, then the statistics for the occupancy across the entire study area were applied to the supplemental inventory.

Emergency Cost Reduction. At the time of the PAC report, damages and benefits associated with debris removal and cleanup were computed in separate HEC-FDA models. For this analysis, the "other" category in the residential and non-residential structure inventory, as well as the associated depth-damage functions, were used to incorporate debris damages and benefits. Damages to infrastructure were also added to

the same HEC-FDA model, but maintained a separate inventory and depth-damage functions.

*Damages to Infrastructure***.** The reduction of potential flood damages to the infrastructure (streets and highways, bridges, railroads, ports, airports, land-based pipelines, and petroleum wells) in an evaluation area can form a significant category of benefits attributable to a project alternative. For purposes of this analysis, only the damages to streets, highway, and railroads were considered. Streets are defined as roadways with two lanes with relatively lower volumes of traffic and access, while major and secondary highways are defined as roadways with four lanes with relatively higher volumes of traffic and access.

Details about the creation of the infrastructure inventory and depth-damage functions can be found in the PAC report. For the purposes of this economic update, the same inventory and depth-damage functions were used with the inventory indexed to reflect a FY22 price level using the Civil Works Construction Cost Index System for the Roads, Railroads & Bridges feature code.

Debris Removal Costs. Debris removal costs are typically discussed in the Other Benefit Categories section of the Economic Appendix. However, since debris removal costs were included as part of the HEC-FDA structure records for the individual residential and non-residential structures in this economic update, these costs are being treated as an economic input. The HEC-FDA model does not report debris removal costs separately from the total expected annual without-project and with-project damages.

Following Hurricanes Katrina and Rita, interviews were conducted with experts in the fields of debris collection, processing and disposal to estimate the cost of debris removal following a storm event. Information obtained from these interviews was used to assign debris removal costs for each residential and non-residential structure in the Coastal Texas structure inventory. The experts provided a minimum, most likely, and maximum estimate for the cleanup costs associated with the 2 feet, 5 feet, and 12 feet depths of flooding. A prototypical structure size in square feet was used for the residential occupancy categories and for the non-residential occupancy categories. The experts were asked to estimate the percentage of the total cleanup caused by floodwater and to exclude any cleanup that was required by high winds.

To account for the cost/damage surrounding debris cleanup, values for debris removal were incorporated into the structure inventory for each record according to its occupancy type. These values were then assigned a corresponding depth-damage function with uncertainty in the HEC-FDA model. For all structure occupancy types, 100 percent damage was reached at 12 feet of flooding. All values and depth-damage functions were selected according to the long-duration flooding data specified in a report titled "Development of Depth-Emergency Cost and Infrastructure Damage Relationships for Selected South Louisiana Parishes." The debris clean-up values provided in the report were expressed in 2010 price levels for the New Orleans area. All values were first

indexed using RSMeans Historical Cost Index to represent a FY21 price level and then indexed using the Consumer Price Index (CPI) less food and energy to represent a FY22 price level. The debris removal costs included as the "other" category on the HEC-FDA structure records for the individual residential and non-residential structures and used to calculate the expected annual without-project and with-project debris removal and cleanup costs are displayed in Table 10.

Table 10
Morganza to the Gulf Economic Update
Debris Values
(FY22 Price Level)

Structure Category	Structure Occupancy	FDA Occupancy	Debris Value ($ Dollars)
Residential	One-Story Single Family	1STY-	$7,989
	Two-Story Single Family	2STY-	$10,690
	Mobile Home	MOBHOM	$8,215
Non-Residential	Eating and Recreation	EAT	$48,388
	Grocery and Gas Station	GROC	$51,315
	Professional	PROF	$50,077
	Public and Semi-Public	PUBL	$50,077
	Multi-Family	MULT	$14,404
	Repair and Home Use	REPA	$51,877
	Retail and Personal Services	RETA	$49,740
	Warehouse	WARE	$88,788
	Interviewed Industrial	IND_S	$88,788

Note: "Interviewed Industrial" is a category, not an occupancy in HEC-FDA

Depth-Damage Relationships. Site-specific saltwater, long duration (approximately one week) depth-damage relationships, developed by a panel of building and construction experts for the Morganza evaluation, were used in the economic analysis. These curves indicate the percentage of the total structure value that would be damaged at various depths of flooding. Damage percentages were determined for each one-half foot increment from one-half foot below first floor elevation to two feet above first floor, and for each one-foot increment from 2 feet to 15 feet above first floor elevation. The panel of experts developed depth-damage relationships for five residential structure categories and for three commercial structure categories. Depth-damage relationships were also developed for three residential content categories and eight commercial content categories. A unique depth-damage relationship was developed for the contents of each

of the 24 industrial structures in the study area based on information provided by the owners of the properties using OMB-approved interview forms.

The depth-damage relationships for vehicles were developed based on interviews with the owners of automobile dealerships that had experienced flood damages and were used to calculate flood damages to vehicles at the various levels of flooding.

Table 11 shows the residential and non-residential depth-damage relationships developed for structures, contents, and vehicles, as well as transportation infrastructure. Due to length, this table can be found at the end of this appendix. More specific data regarding the depth-damage relationships can be found in the final report dated May 1997 titled *Depth-Damage Relationships for Structures, Contents, and Vehicles and Content-to-Structure Value Ratios (CSVRs) in Support of the Lower Atchafalaya and Morganza to the Gulf, Louisiana, Feasibility Study*.

Uncertainty Surrounding the Economic Inputs. The uncertainty surrounding the four key economic variables was quantified and entered into the HEC-FDA model. These economic variables included structure values, contents-to-structure value ratios, first floor elevations, and depth-damage relationships. The HEC-FDA model used the uncertainty surrounding these variables to estimate the uncertainty surrounding the stage-damage relationships developed for each study area reach.

Structure and Vehicle Values. To quantify the uncertainty surrounding the values calculated for the residential and non-residential structure inventory, several survey teams valued an identical set of structures from various evaluation areas in the gulf coast region. The structure values calculated by each of the teams during windshield surveys were used to develop a mean value and a standard deviation for each structure in the sample. The standard deviation was then expressed as a percentage of the mean value for that structure. The average standard deviation as a percentage of the mean for the sampled structures was then used to represent the uncertainty surrounding the structure value for all the inventoried residential and non-residential structures. The average standard deviation, which was expressed as a percentage of the mean structure value, totaled 12.15 percent for residential structures and 14.28 percent for non-residential structures.

The uncertainty surrounding the values assigned to the vehicles in the inventory was determined using a triangular probability distribution function. The Manheim vehicle value, adjusted for number of vehicles per household and for the evacuation of vehicles prior to a storm event, was used as the most likely value. The average value of a new vehicle before taxes, license, and shipping charges was used as the maximum value, while the average 10-year depreciation value of a vehicle was used as the minimum value.

Content-to-Structure Value Ratios. Onsite interviews were conducted with the owners of a sample of ten structures from each of the three residential content categories (30

residential structures) and each of the eight non-residential content categories (80 non-residential structures). A CSVR was computed for each residential and non-residential structure in the sample based on the total depreciated content value developed from these interviews. A probability distribution function derived using the statistical bootstrapping method was then used to describe the distribution of these observations around the expected mean value. The mean and standard deviation values for each residential and non-residential category were entered into the HEC-FDA model. The model used a normal probability density function to describe the uncertainty surrounding the CSVR for each content category. The expected values and standard deviations are shown for each of the three residential categories and the eight non-residential categories in the final report dated May 1997 titled *Depth-Damage Relationships for Structures, Contents, and Vehicles and Content-to-Structure Value Ratios (CSVRs) in Support of the Lower Atchafalaya and Morganza to the Gulf, Louisiana Feasibility Study*. Since the CSVRs for the 24 surveyed industrial structures in the study area were based on information provided by the property owners, there was no uncertainty surrounding these ratios.

First Floor Elevations. The topographical data used to estimate the first-floor elevations assigned to the structure inventory contain two sources of uncertainty. The first source of uncertainty arises from the use of the 2009 LIDAR data, and the second source of uncertainty arises from the use of hand levels to determine the structure foundation heights above ground elevation. The error implicit in using LIDAR data to estimate the ground elevation of each of the inventoried structures is normally distributed with a mean of zero and a standard deviation of 0.219 feet. These statistics were calculated based on comparing 2,241 engineering survey points or spot elevations to the elevations determined using the 2009 LIDAR data throughout the evaluation area. According to the Hydrologic Engineering Center training manual, the uncertainty implicit in estimating foundation heights using hand levels from within 50 feet of the structure is normally distributed with a mean of zero and a standard deviation of 0.3 feet at the 95 percent level of confidence.

Based on the error surrounding the LIDAR data and the error arising from the use of hand levels, the total uncertainty was estimated for each structure category at the 90 percent level of confidence. The two standard deviations (LIDAR and hand levels) were squared and then totaled. The square root of this total, 0.297 feet, represents the uncertainty surrounding the first-floor elevations assigned to the structures located in the Morganza evaluation area.

Debris Removal Costs. The uncertainty surrounding debris percentage values at 2 feet, 5 feet and 12 feet depths of flooding were based on range of values provided by the four experts in the fields of debris collection, processing, and disposal. The questionnaires used in the interview process were designed to elicit information from the experts regarding the cost of each stage of the debris cleanup process by structure occupancy type. The range of responses from the experts were used to calculate a mean value and standard deviation value for the cleanup costs' percentages provided at 2 feet, 5 feet, and 12 feet depths of flooding. The mean values and the standard deviation values were

entered into the HEC-FDA model as a normal probability distribution to represent the uncertainty surrounding the costs of debris removal for residential and non-residential structures. The depth-damage relationships containing the damage percentages at the various depths of flooding and the corresponding standard deviations representing the uncertainty are shown within the depth–damage tables.

Depth-Damage Relationships. A triangular probability density function was used to determine the uncertainty surrounding the damage percentage associated with each depth of flooding. A minimum, maximum and most likely damage estimate was provided by a panel of experts for each depth of flooding. The specific range of values regarding probability distributions for the depth-damage curves can be found in the final report dated May 1997 titled *Depth-Damage Relationships for Structures, Contents, and Vehicles and Content-to-Structure Value Ratios (CSVRs) in Support of the Lower Atchafalaya and Morganza to the Gulf, Louisiana, Feasibility Study*.

The owners of the 11 industrial properties provided a minimum, maximum, and most likely content damage estimate for each depth of flooding using OBM-approved survey forms. Copies of the OBM survey forms used to develop the depth-damage relationships can be found in the final report dated May 2009 titled *Morganza to the Gulf Post Authorization Change Report: Residential and Nonresidential Structure Inventory and Nonresidential Surveys*.

ENGINEERING INPUTS TO THE HEC-FDA MODEL

Ground Elevations. Geospatial Engineering acquired elevation data for the Morganza study area in 2009. The LIDAR data were processed and used to create a DEM with a five-foot by five-foot horizontal grid resolution. The DEM used NAVD88 epoch 2004.65 vertical datum to determine the ground elevations for each of the residential and non-residential structures in the evaluation area. Since the engineering inputs provided for the economic update continued to be based off of this datum, all economic inputs were also kept at the NAVD88 epoch 2004.65 vertical datum.

Stage-Probability Relationships. Stage-probability relationships were provided for the base year of the project (2035) and the final year in the period of analysis (2085) under both without-project and with-project conditions for each of the 266 study area reaches. Water surface profiles were provided for eight AEP events: 99 percent (1-year), 20 percent (5-year), 10 percent (10-year), 4 percent (25-year), 2 percent (50-year), 1 percent (100-year), 0.5 percent (200-year), and 0.2 percent (500-year). The water surface profiles were based only on storm surge and did not incorporate heavy rainfall events.

Non-Federal and Federal Levee Performance. Local levee systems provide flood risk reduction under existing conditions for structures located within 78 of the study area reaches. A set of fragility curves, which relates specific stages in NAVD 88 (2004.65 epoch) on the exterior side of the levee to four probabilities of levee failure (zero percent, ten percent, forty-five percent, and ninety-five percent), were developed for each of the local levee systems under the without-project condition. It was assumed that there was a zero percent probability of failure at the 2-foot stage for all local levees.

The fragility curves developed for each of the local levee systems considered multiple failure modes, including the slope of the levee, seepage, wave heights, overtopping, and erodibility. The failure of an existing non-Federal levee typically occurs when the structural integrity of the levee is compromised by the storm surge. However, geotechnical failure analyses conducted in the evaluation area determined that there is only a 1 to 3 percent probability of failure at the top of the levee due to stability issues. Thus, overtopping and erodibility were used to develop the non-Federal levee fragility curves.

The fragility curves for the non-Federal levee system were entered into the HEC-FDA model for each study area reach containing a non-Federal levee to assess the performance of the non-Federal levee system. Table 12 shows the non-Federal levee fragility curves and the top of levee elevation developed for each of the study area reaches containing a levee.

Table 12
Morganza to the Gulf Economic Update
Non-Federal Levee Fragility Curves
(Feet; NAVD88 epoch 2004.65)

Reach Name	Station	Elevation Associated with Probability of Failure				Top of Levee Elevation
		0%	10%	45%	95%	
1-1AB	1	2.0	3.8	4.4	4.7	5.0
1-1AN	4	2.0	3.8	4.4	4.7	5.0
11BE4	16	2.0	4.5	5.3	5.6	6.0
11BE5	19	2.0	3.0	3.5	3.7	4.0
11BE6-W	25	2.0	4.5	5.3	5.6	6.0
11BW11	40	2.0	2.3	2.6	2.8	3.0
11BW5	58	2.0	4.1	4.8	5.1	5.5
11BW6	61	2.0	4.1	4.8	5.1	5.5
11BW79	64	2.0	4.5	5.3	5.6	6.0
11BW79-W7	67	2.0	4.1	4.8	5.1	5.5
1-2S	76	2.0	3.0	3.5	3.7	4.0
1-3	79	2.0	4.9	5.7	6.0	6.5
1-5	82	2.0	2.3	2.6	2.8	3.0
1-7_N3-4	85	2.0	4.1	4.8	5.1	5.5
1-7_N4-7	88	2.0	4.1	4.8	5.1	5.5
1-7_N7-10	91	2.0	4.1	4.8	5.1	5.5
1-7-N10-13	94	2.0	4.1	4.8	5.1	5.5
1-7N13-16	97	2.0	4.1	4.8	5.1	5.5
1-7N16-17	100	2.0	4.1	4.8	5.1	5.5
1-7N17-24	103	2.0	4.1	4.8	5.1	5.5
1-7N24-28	106	2.0	4.1	4.8	5.1	5.5
3-1B	124	2.0	7.1	8.4	8.8	9.5
3-1C	127	2.0	4.5	5.3	5.6	6.0
4-1N	130	2.0	3.0	3.5	3.7	4.0
4-1S	133	2.0	5.3	6.2	6.5	7.0
4-2	136	2.0	3.0	3.5	3.7	4.0
4-2A	139	2.0	4.5	5.3	5.6	6.0
4-2B	142	2.0	4.5	5.3	5.6	6.0
4-2C	145	2.0	4.5	5.3	5.6	6.0
4-7	148	2.0	4.5	5.3	5.6	6.0
4MGT	151	2.0	4.5	5.3	5.6	6.0
5-1A	154	2.0	4.5	5.3	5.6	6.0
5-1B	157	2.0	4.5	5.3	5.6	6.0
6-1B1	160	2.0	4.5	5.3	5.6	6.0
6-1B1-B	163	2.0	4.5	5.3	5.6	6.0
8-1N	166	2.0	3.0	3.5	3.7	4.0
8-1N-B	169	2.0	3.0	3.5	3.7	4.0
8-1S-B	175	2.0	3.0	3.5	3.7	4.0
8-2C	178	2.0	4.5	5.3	5.6	6.0

Table 12 (continued)
Morganza to the Gulf Economic Update
Non-Federal Levee Fragility Curves
(Feet; NAVD88 epoch 2004.65)

Reach Name	Station	Elevation Associated with Probability of Failure				Top of Levee Elevation
		0%	10%	45%	95%	
8-2D	181	2.0	4.5	5.3	5.6	6.0
9-1AE	184	2.0	6.0	7.0	7.4	8.0
9-1AMID	187	2.0	6.0	7.0	7.4	8.0
9-1AW	190	2.0	6.0	7.0	7.4	8.0
9-1BMIDE	196	2.0	6.0	7.0	7.4	8.0
9-1BMIDW	199	2.0	6.0	7.0	7.4	8.0
9-1BW	202	2.0	6.0	7.0	7.4	8.0
BL2	280	2.0	4.5	5.3	5.6	6.0
BL3	283	2.0	4.5	5.3	5.6	6.0
BL4	286	2.0	3.8	4.4	4.7	5.0
BL5	289	2.0	3.8	4.4	4.7	5.0
BL6	292	2.0	3.8	4.4	4.7	5.0
BL7	295	2.0	4.5	5.3	5.6	6.0
BL89	298	2.0	3.8	4.4	4.7	5.0
BPC3	307	2.0	4.5	5.3	5.6	6.0
BPC4	310	2.0	4.5	5.3	5.6	6.0
BT4	331	2.0	4.5	5.3	5.6	6.0
BT4-SA	334	2.0	5.3	6.2	6.5	7.0
D-01	367	2.0	7.5	8.8	9.3	10.0
D10	373	2.0	4.5	5.3	5.6	6.0
D-16S	379	2.0	3.0	3.5	3.7	4.0
D-25	406	2.0	5.3	6.2	6.5	7.0
D-29	418	2.0	4.9	5.7	6.0	6.5
D-30	421	2.0	3.0	3.5	3.7	4.0
D-36	436	2.0	7.1	8.4	8.8	9.5
D-48	466	2.0	3.0	3.5	3.7	4.0
D-53	478	2.0	3.8	4.4	4.7	5.0
D-56	481	2.0	4.5	5.3	5.6	6.0
D-60	484	2.0	4.5	5.3	5.6	6.0
D-61	487	2.0	4.5	5.3	5.6	6.0
D-61-B	490	2.0	4.5	5.3	5.6	6.0
D-62-B	496	2.0	4.5	5.3	5.6	6.0
D-64	499	2.0	3.8	4.4	4.7	5.0
E2-LF	517	2.0	4.0	4.7	5.0	5.4
E2-LF-B	520	2.0	4.0	4.7	5.0	5.4
LBC1	670	2.0	4.5	5.3	5.6	6.0
LBC2	673	2.0	4.5	5.3	5.6	6.0
PAC1	709	2.0	7.5	8.8	9.3	10.0
SL3	718	2.0	7.5	8.8	9.3	10.0

Federal levees will provide flood risk reduction under future conditions for residential and non-residential structures located within 235 of the study area reaches. Each of these 235 study area reaches was assigned to one of the ten major Federal levee reaches (A, B, and E through L) based on the location of the reach and the path of the storm surge, should the Federal levee fail. Single point fragility curves were developed for the Federal levee system. The Federal levees are assumed to fail with certainty once the surge stage reaches the top of the levee height assigned to each study area reach. Only a top of the Federal levee elevation was entered into the HEC-FDA model for each of the study area reaches. The top of the levee elevation in this analysis does not represent the actual height of the Federal levee; rather, it represents the still water stage elevation at which the levee is assumed to fail. At this stage, which is below the actual top of the levee, waves will overtop the Federal levee at a rate of 2 cubic feet per second (cfs). Table 13 shows the top of Federal levee still water stage or elevation for each of the major levee reaches for each of the 1 percent AEP alternative.

Table 13
Morganza to the Gulf Economic Update
Elevation Associated with Failure by Federal Levee Reach
(Feet; NAVD88 epoch 2004.65)

Reach	Levee Failure Elevation	
	2035	2085
A	12.13	16.16
B	13.83	16.90
E	16.00	18.50
F	15.47	16.97
G	16.77	17.97
H	17.12	19.62
I	18.32	21.83
J	18.53	21.29
K	18.22	22.59
L	18.54	21.76

When existing non-Federal or Federal levees are included in the analysis, an exterior-interior stage relationship must be considered in the analysis. The exterior-interior stage relationship defines the relationship between the water surface elevation, or stage, outside of the levee and the stage within the floodplain behind the levee. Under the with-project conditions, exterior and interior stage relationships were provided for each study area reach. In the event of a Federal levee failure, the interior surge elevation changes as the distance from the levee increases. Thus, a unique interior surge elevation curve was provided for each interior study area reach under with-project conditions. Under the without-project condition, an exterior-interior stage relationship was not provided for each study area reach. In the event of a non-Federal levee failure, the elevation of the

surges within the reach is the same on both sides of the levee regardless of the distance from the levee.

Uncertainty Surrounding the Engineering Inputs. The uncertainty surrounding three key engineering parameters was quantified and entered into the HEC-FDA model. These engineering variables included ground elevations, stage-probability curves, and performance of the non-Federal and Federal levees. The HEC-FDA model used the uncertainty surrounding these variables to estimate the uncertainty surrounding the elevation of the storm surges for each study area reach.

Ground Elevations. An engineering survey was conducted to estimate the uncertainty surrounding the use of the 2009 LIDAR data to estimate ground elevations in urbanized areas. The LIDAR data were compared to 2,241 spot elevations, or engineering survey points, throughout the urbanized portions of the evaluation area. The uncertainty surrounding these data was found to be normally distributed with a mean of zero and a standard deviation of 0.219 feet. (A combination of the uncertainty surrounding the ground elevations and the foundation height of a residential and non-residential structure was discussed in the first-floor elevation uncertainty section of this report.)

Stage-Probability Relationships. A 50-year equivalent record length was used to quantify the uncertainty surrounding the stage-probability relationships for each study area reach. Based on this equivalent record length, the HEC-FDA model calculated the confidence limits surrounding the stage-probability functions.

Levee Performance. The uncertainty surrounding the performance of the non-Federal levees was based on the fragility curves entered for each study area reach. The Federal levees are assumed to fail with certainty once the surge stage reaches the top of the levee height assigned to each study area reach.

PART 3: NATIONAL ECONOMIC DEVELOPMENT (NED) FLOOD DAMAGE AND BENEFIT CALCULATIONS

NED FLOOD DAMAGE AND BENEFIT CALCULATIONS FOR STRUCTURES, CONTENTS, AND VEHICLES

HEC-FDA Model Calculations. The HEC-FDA model was used to evaluate flood damages using risk-based analysis. Damages were reported at the index location for each of the 266 study area reaches. A range of possible values, with a maximum and a minimum value for each economic variable (first floor elevation, structure and content values, and depth-damage relationships), was entered into the HEC-FDA model to calculate the uncertainty or error surrounding the elevation-damage, or stage-damage, relationships. The model also used the number of years that stages were recorded at a given gage to determine the hydrologic uncertainty surrounding the stage-probability relationships. Fragility curves for the non-Federal levees and top of levee elevations and exterior/interior stage relationships for Federal levees were entered into the levee features section of the model.

The possible occurrences of each variable were derived through the use of Monte Carlo simulation, which used randomly selected numbers to simulate the values of the selected variables from within the established ranges and distributions. For each variable, a sampling technique was used to select from within the range of possible values. With each sample, or iteration, a different value was selected. The number of iterations performed affects the simulation execution time and the quality and accuracy of the results. This process was conducted simultaneously for each economic and hydrologic variable. The resulting mean value and probability distributions formed a comprehensive picture of all possible outcomes.

Stage-Damage Relationships with Uncertainty. The HEC-FDA model used the economic inputs to generate a stage-damage relationship for each structure category in each study area for the base year of 2035 and future year of 2085. The possible occurrences of each economic variable were derived through the use of Monte Carlo simulation. A total of 1,000 iterations were executed by the model for the Morganza evaluation. The sum of all sampled values was divided by the number of samples to yield the expected value for a specific simulation. A mean and standard deviation was automatically calculated for the damages at each stage.

Stage-Probability Relationships with Uncertainty. The HEC-FDA model used an equivalent record length (50 years) for each study area reach to generate a stage-probability relationship with uncertainty for the without-project and the with-project alternatives in 2035 and 2085 conditions through the use of graphical analysis. Due to uncertainties remaining relatively the same as the time of the PAC Report, the equivalent

record length from that time, which was based on gage data, was adapted without alteration. The model used the eight stage-probability events together with the equivalent record length to define the full range of the stage-probability or stage-probability functions by interpolating between the data points. Confidence bands surrounding the stages for each of the probability events were also provided.

Without-Project Expected Annual Damages. The model used Monte Carlo simulation to sample from the stage-probability curve with uncertainty. For each of the iterations within the simulation, stages were simultaneously selected for the entire range of probability events. For the study area reaches without a non-Federal levee system, the Monte Carlo simulation then selects a corresponding damage value for each of the stages from the stage-damage relationships with uncertainty. For the study area reaches with a non-Federal levee system, the Monte Carlo simulation also selects a failure probability from the fragility curve developed for the non-Federal levee. If the selected stages from the stage-probability curve are below the height of the non-Federal levee, then the fragility curve is used to determine if there is levee failure. If the levee fails, then a damage estimate is sampled from the stage-damage relationship. However, if the levee does not fail, then zero damages will be selected for that iteration. If the selected stages are equal to or above the height of the non-Federal levee and the levee fails, then the Monte Carlo simulation will select a damage value from the stage-damage relationship with uncertainty for that iteration. There are no exterior-interior stage probability relationships under the without-project conditions.

The sum of all damage values divided by the number of iterations run by the model yielded the expected value, or mean damage value, with confidence bands for each probability event. The probability-damage relationships are integrated by weighting the damages corresponding to each magnitude of flooding (stage) by the percentage chance of exceedance (probability). From these weighted damages, the model determined the expected annual damages (EAD) with confidence bands (uncertainty). For the without-project alternative, the EAD were totaled for each study area reach to obtain the total without-project EAD under base year 2035 and future year 2085 conditions.

Most Likely Future Condition Adjustments. The without-project EAD calculated as part of the economic analysis do not consider the behavior of property owners whose structures have incurred repetitive flood losses. The HEC-FDA model implicitly assumes that all damaged assets will be restored to their prior market value completely and instantaneously after each storm event. However, property owners could also opt to have their structures raised in place, floodproof and/or retrofit their structures, relocate within the floodplain, or permanently evacuate from the study area. The course of action selected by an individual property owner following repetitive flood losses depends upon many factors, including the degree of aversion to future anticipated flood risk by that property owner.

Historical Response to Flood Events. The Morganza study area experienced numerous flood events during the past several decades. Historical data show that the post-flood

response of property owners to the flood events prior to 2005 did not result in significant outmigration from the study area. Data from the 2000 Census show that approximately 65 percent of residents in the Lafourche and Terrebonne Parishes lived in the same housing unit as they had in 1995. This percentage ranged from a high of 81 percent in Dulac (southern portion of the study area) to a low of 54 percent in Thibodaux (northern portion of the study area). In comparison, the national percentage of the population residing in the same house in 2000 as in 1995 was 54 percent.

According to local officials, residents in low-lying communities began relocating to areas in the northern parts of the study area after Hurricanes Katrina and Rita impacted the area in 2005. Reasons for this intra-parish shift were a combination of weariness on the part of residents of having to deal with repeat flooding and the more stringent requirements to obtain permits for rebuilding after homes were damaged. To rebuild, residents had to incur the cost of building to higher elevations. The ability to secure insurance at a reasonable price was also cited as a reason for the exodus.

The rate of retreat from the southern communities slowed around 2008 after Hurricane Ike impacted the area due to Federal assistance, as well as the construction of local levees, which reduced damages to the area. In addition, the two parishes have also implemented elevation programs designed to raise the structures in flood-prone areas. The elevation costs have been offset by state and Federal funding and, in the case of properties with flood insurance, supplemental support in the form of FEMA Increased Cost of Compliance Grants. These programs have made structure elevation more affordable for residents.

Local officials also stated that residents prefer to remain due to the culture of the residents and the economy of the area. The economy of Terrebonne Parish is closely tied to its abundant natural resources, and many of the residents in the small communities outside of Houma are shrimpers, oystermen, crabbers, fishermen, and trappers. In Lafourche Parish, the economy is strongly tied to the production and distribution of natural gas and oil, commercial fishing, and sugar cane.

Historical data show that recent flood events have not resulted in significant outmigration from the study area, and the post-flood response of property owners in the past has been consistent with the HEC-FDA assumption that the structure inventory will remain in place throughout the period of analysis. Although the HEC-FDA certified model is a probability-based, and not an event-driven, model, the assumption that structures will be completely and immediately repaired is rarely the case for major flood events. While it may require considerable time (months to years) to fully complete repairs, past population trends, nevertheless, indicate that residents and the structures in which they live have not been permanently removed from the study area. However, the manner in which property owners have responded in the past may or may not be representative of how they will respond in the future to more repetitive and more severe flood events. The more frequent and damaging that flood events become due to sea level rise, the less time property owners have to repair damaged structures prior to the next flood. Thus,

adjustments were made to the 2035 and 2085 structure inventories to account for the projected rise in relative sea level.

Structure Inventory Adjustments. The adjustments were made to the structure inventory in two phases. First, all properties with a first floor elevation less than or equal to 2035 or 2085 without-project 99 percent AEP (1-year) water surface elevation exterior to the non-Federal levee, if it exists, within each study area reach were raised to the 2085 99 percent AEP (1-year) plus 0.01 feet. This adjustment was made to 379 structures and corrects for possible errors in placement of the inventory while not allowing yearly recurring damages. This adjusted inventory was run through HEC-FDA and the intermediary outputs were used for the next phase of adjustments. Second, all structures showing 50 percent or more structure damage in the 2035 without-project 10 percent AEP (10-year) event were raised to the 2085 1 percent AEP (100-year) without-project stage. This adjustment was made to 191 structures and follows the assumption that owners experiencing severe frequent flooding will perform some kind of self-mitigation. Table 14 shows the number of structures damaged after adjustments at each probability event in the 2035 without-project condition.

Table 14
Morganza to the Gulf Economic Update
Number of Structures Damaged by 2035 Without-Project Probability Event and Category

Annual Chance Exceedance Event (ACE)	Residential	Mobile Homes	Commercial	Industrial	Surveyed Industrial	Total
0.99 (1 yr)	-	-	-	-	-	-
0.20 (5 yr)	210	-	98	-	-	308
0.10 (10 yr)	797	146	542	10	4	1,499
0.04 (25 yr)	5,348	2,039	1,367	25	18	8,797
0.02 (50 yr)	12,637	3,725	2,644	50	22	19,078
0.01 (100 yr)	21,910	5,842	3,990	63	23	31,828
0.005 (200 yr)	31,706	7,807	5,029	87	23	44,652
0.002 (500 yr)	39,559	9,778	5,944	108	23	55,412

Rationale for the Adjustments. The adjustments made to the structure inventory were designed to account for the future behavior of property owners whose structures incur repetitive flooding. Beyond the dollar damage and disruptions associated with a flood event, a variety of considerations influence individual property owner rebuild decisions. Significant among these considerations are FEMA requirements for participation in the flood insurance program and the local permitting rules adopted by communities.

FEMA rules require that a structure located within the 1 percent AEP (100-year) floodplain receiving 50 percent or more structural damage from an individual flood event must elevate if it is to be rebuilt/repaired at the original location. Additionally, FEMA has requirements in place to address repetitively damaged properties. FEMA defines a repetitive flood loss property as one that incurs flood damages greater than $1,000 two or

more times during a 10-year period. FEMA defines a severe repetitively flooded property as one that incurs flood damage two or more times during a ten-year period with the cumulative value of these damages exceeding the value of the structure, or one that has four claims exceeding a specifically defined amount over the same period. Thus, to be compliant with FEMA rules, severely repetitively flooded properties experiencing such damages would have to be elevated to the 1 percent AEP (100-year) event level. Property owners could also choose to implement an equivalent mitigation measure or face a significant increase in flood insurance premiums. Finally, the parish could enforce its own elevation requirements for properties in the high-risk flood zones that are severely damaged or are identified as repetitive flood properties, even if the owners are not National Flood Insurance Program policy holders.

With-Project Expected Annual Damages. The with-project stage probability curves with uncertainty relate the stages on the exterior of the Federal levee system to each probability event. An exterior-interior stage relationship was also entered into the HEC-FDA model for each study area reach. The exterior-interior stage curve relates the stages on the outside of the Federal levee system to the stages on the inside of the Federal levee system for each study area reach. For the Morganza evaluation, the exterior stages were set equal to the water surface profiles from the with-project stage probability relationships for each reach, and the interior stages were set equal to the water surface profiles from the without-project stage-probability relationships. Additionally, since only single point fragility curves were developed for the Federal levee system, a top of the levee elevation was assigned and entered into the model for each study area reach. This elevation is below the actual top of the levee elevation to account for wave action above the still water stages. At stages below the top of the levee elevation, there is a 100 percent chance that the Federal levee will not fail. At stages equal to or greater than the top of the levee elevation, there is a 100 percent chance that the levee will fail.

The HEC-FDA model used Monte Carlo simulation to sample from the with-project stage-probability relationships with uncertainty for each iteration run by the model. The exterior stage randomly selected by the model was then compared to the top of the Federal levee elevation for each study area reach. If the exterior stage was below the top of the levee elevation, a zero damage value was assigned to that exterior stage. If the exterior stage selected by the model was equal to or above the height of the Federal levee, the related interior stage was used to calculate the damages from the stage-damage relationships with uncertainty. In this case, the with-project interior damages would be equal to the without-project damages for that probability event.

The sum of all damage values divided by the number of iterations run by the model yielded the expected value, or mean damage value, with confidence bands for each probability event. The probability-damage relationships were integrated by weighting the damages corresponding to each magnitude of flooding (stage) by the percentage chance of exceedance (probability). From these weighted damages, the model determined the EAD with confidence bands (uncertainty). For the with-project alternative, the EAD were

totaled for each study area reach to obtain the total with-project EAD under base year 2035 and future year 2085 conditions.

Damages resulting from waves overtopping Federal levees were not calculated in this analysis. Since the top of levee elevations specified in the HEC-FDA model are less than the design top of the Federal levee, wave action above the still water stage has been incorporated into levee performance. Also, the study area reaches south of the City of Houma contain marshland that function as storage area for any excess storm surges attributable to residual wave overtopping. The exclusion of the potential damages from overtopping are not expected to be significant and does not affect plan formulation.

The performance of non-Federal levees was also not included in the calculation of with-project damages for study area reaches that are inside the Federal levee system. If the storm surge overtops the Federal levees, then it is expected that it will also overtop the non-Federal levees. The HEC-FDA model currently does not have the capability to analyze the performance of two levees simultaneously. The exclusion of non-Federal levee performance under the with-project conditions is not considered to have a significant impact on with-project damages.

For those reaches exterior to the Federal levee, the same process was used to calculate damages as was discussed under the without-project conditions. If a non-Federal levee was present in the reach, then a non-Federal levee fragility curve was used along with the with-project stage-damage relationships with uncertainty to calculate damages. If a non-Federal levee was not present in the reach, then the with-project stage-probability curves were used along with the stage-damage relationships with uncertainty to calculate damages. The with-project stages for the exterior reaches could be higher than the without-project stages for a range of probability events. The Federal levee reduces the impact of the storm surge on the interior reaches, but it elevates the stages and induces damages in all exterior reaches.

Induced Damages. Fifteen study area reaches located outside the proposed Federal levee system incur higher stages for various AEP storm events with the project in place for the years 2035 and 2085. The HEC-FDA model station numbers associated with these reaches are 163, 169, 175, 235, 256, 316, 340, 490, 496, 508, 514, 556, 604, 631, and 796. Since these reaches experience induced damages as a direct result of the project alternative, all properties in the impacted reaches would be acquired and the residents would be relocated to areas outside the 100-year floodplain. This approach ensures the project captures the maximum cost estimate for buyouts associated with inducements. To model this, all residential and non-residential structures, their contents, and vehicles, as well as the debris removal and cleanup costs, were removed for each of these reaches in the with-project modeling and were not included in the total damages for the 1 percent AEP with-project alternative.

Expected Annual Inundation Reduction Benefits. The HEC-FDA model compared the without-project damages with uncertainty to the with-project damages with uncertainty to calculate the expected benefits with uncertainty for the project alternative. Benefits were calculated for the project base year (2035) and future conditions (2085). Table 15 shows the expected annual without-project damages, with-project damages, and benefits (damages reduced) for the years 2035 and 2085 for all categories modeled in the HEC-FDA model. This table also displays the percentage of expected annual benefits attributable to each modeled category.

Table 15
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Category
($ Thousands; FY22 Price Level)

2035				
Category	Without-Project Damages	With- Project Damages	Damages Reduced	% of Total Benefits
Residential	$257,399	$49,518	$207,881	46.0%
Mobile Homes	$11,477	$1,940	$9,537	2.1%
Commercial	$225,808	$38,430	$187,378	41.5%
Industrial	$12,066	$1,826	$10,240	2.3%
Interviewed Industrial	$12,808	$2,154	$10,654	2.4%
Vehicles	$20,577	$2,774	$17,803	3.9%
Streets	$8,847	$2,600	$6,247	1.4%
Highways	$2,603	$602	$2,001	0.4%
Railroads	$29	$9	$20	0.0%
Total	**$551,614**	**$99,854**	**$451,760**	**100%**
2085				
Category	Without-Project Damages	With- Project Damages	Damages Reduced	% of Total Benefits
Residential	$1,487,220	$74,997	$1,412,223	50.0%
Mobile Homes	$61,307	$2,876	$58,431	2.1%
Commercial	$1,148,300	$64,793	$1,083,507	38.4%
Industrial	$63,845	$3,566	$60,279	2.1%
Interviewed Industrial	$57,876	$2,480	$55,395	2.0%
Vehicles	$103,599	$4,008	$99,591	3.5%
Streets	$43,569	$4,231	$39,337	1.4%
Highways	$15,296	$1,129	$14,167	0.5%
Railroads	$210	$62	$148	0.0%
Total	**$2,981,220**	**$158,142**	**$2,823,078**	**100%**

Table 16 shows the expected annual without-project damages, with-project damages, and benefits for the years 2035 and 2085. The table also shows the expected annual benefits at the 25, 50, and 75 percentiles. These percentiles reflect the percentage chance that the benefits will be greater than or equal to the indicated amount. Table 17, which can be found at the back of this appendix, displays expected annual damages and benefits for the years 2035 and 2085 by reach.

Table 16
Morganza to the Gulf Economic Update
Expected Annual Damage Reduced and Distributed
($ Thousands; FY22 Price Level)

Year	Total Without-Project Damages	Total With-Project Damages	Damages Reduced	Probability Damage Reduced Exceeds Indicated Values		
				0.75	0.50	0.25
2035	$ 551,614	$ 99,854	$ 451,760	$ 246,530	$ 422,508	$ 628,350
2085	$ 2,981,220	$ 158,142	$ 2,823,080	$2,165,980	$2,802,510	$ 3,453,670

Equivalent Annual Damages and Benefits. Damages and benefits for each of the years during the period of analysis were computed by the HEC-FDA model for the years between 2035 and 2085 for the 1 percent AEP alternative. The FY22 Federal interest rate of 2.25 percent, or OMB interest rate of 7 percent, was used to discount the stream of expected annual damages and benefits occurring after the base year to calculate the total present value of the damages and benefits over the period of analysis. The present value of the expected annual damages and benefits was then amortized over the period of analysis using the corresponding discount rate to calculate the equivalent annual benefits.

Table 18 shows the equivalent annual without-project damages, with-project damages, and benefits (damages reduced) for the 50-year period of analysis from 2035 to 2085 for all categories modeled in the HEC-FDA model. This table also displays the percentage of equivalent annual benefits attributable to each modeled category.

Table 18
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Category
($ Thousands; FY22 Price Level)

FY 2022 Federal Interest Rate of 2.25%				
Category	Without-Project Damages	With- Project Damages	Damages Reduced	% of Total Benefits
Residential	$758,342	$59,896	$698,446	49.3%
Mobile Homes	$31,774	$2,321	$29,453	2.1%
Commercial	$601,569	$49,169	$552,400	39.0%
Industrial	$33,157	$2,535	$30,622	2.2%
Interviewed Industrial	$31,166	$2,287	$28,878	2.0%
Vehicles	$54,395	$3,276	$51,118	3.6%
Streets	$22,990	$3,265	$19,726	1.4%
Highways	$7,773	$817	$6,956	0.5%
Railroads	$103	$31	$72	0.0%
Total	**$1,541,270**	**$123,596**	**$1,417,674**	**100%**
OMB Interest Rate of 7%				
Category	Without-Project Damages	With- Project Damages	Damages Reduced	% of Total Benefits
Residential	$571,848	$56,032	$515,816	48.8%
Mobile Homes	$24,218	$2,179	$22,038	2.1%
Commercial	$461,678	$45,171	$416,507	39.4%
Industrial	$25,305	$2,271	$23,034	2.2%
Interviewed Industrial	$24,331	$2,238	$22,094	2.1%
Vehicles	$41,805	$3,089	$38,715	3.7%
Streets	$17,725	$3,017	$14,708	1.4%
Highways	$5,848	$737	$5,111	0.5%
Railroads	$75	$23	$53	0.0%
Total	**$1,172,830**	**$114,757**	**$1,058,073**	**100%**

Table 19 shows the equivalent annual without-project damages, with-project damages, and benefits (damages reduced) for the 50-year period of analysis from 2035 to 2085 for all categories modeled in the HEC-FDA model. The table also shows the equivalent annual benefits at the 25, 50, and 75 percentiles. These percentiles reflect the percentage chance that the benefits will be greater than or equal to the indicated amount. Table 20, which can be found at the back of this appendix, displays equivalent annual damages and benefits for the 50-year period of analysis by reach.

Table 19
Morganza to the Gulf Economic Update
Equivalent Annual Damage Reduced and Distributed
($ Thousands; FY22 Price Level)

Interest Rate	Total Without-Project Damages	Total With-Project Damages	Damages Reduced	Probability Damage Reduced Exceeds Indicated Values		
				0.75	0.50	0.25
Federal 2.25%	$ 1,541,270	$ 123,596	$ 1,417,670	$ 1,028,380	$ 1,391,950	$ 1,779,190
OMB 7%	$ 1,172,830	$ 114,757	$ 1,058,080	$ 737,305	$ 1,031,040	$ 1,350,750

OTHER NED BENEFIT CATEGORIES

General. In addition to the physical damages to structures, contents, and vehicles, there are five other categories of NED benefits that are attributable to the Morganza alternative: avoidance of structure-raising costs, emergency cost reductions, agricultural benefits, safe harbor of large commercial and recreational boat fleets, and municipal water supply benefits. At the time of the PAC report, these benefit categories accounted for less than 10 percent of the total benefits associated with the project alternative. For this economic update, only the debris removal and cleanup of the residential and non-residential structures, and the physical damages to streets and highways (emergency cost reductions) were analyzed using updated costs and hydraulic conditions. Benefit calculations from the PAC report associated with avoidance of structure-raising costs, safe harbor of large commercial and recreational boat fleets, and municipal water supply were scaled to current values using the with- and without-project HEC-FDA results as shown in Table 21 below. More information about the initial creation and assessment of these benefit categories can be found in the PAC report.

Table 21
Morganza to the Gulf Economic Update
Scaling of Water Supply, Boat Fleets, and Avoided Structure-Raising Cost Categories
($ Thousands)

PAC Report Equivalent Annual Damages and Benefits Without Future Development (FY 2011 Price Level; 3.75% Discount Rate)				
Category	Without-Project Damages	With- Project Damages	Damages Reduced	% of Total Benefits
HEC-FDA Categories	$812,182	$123,697	$688,486	99.3%
Water Supply	$141	$72	$68	0.0%
Boat Fleets	$17	$2	$15	0.0%
Avoided Structure-Raising Costs	$4,937	$0	$4,937	0.7%
Total	**$817,277**	**$123,771**	**$693,506**	**100.0%**
FY 2022 Federal Interest Rate (FY 2022 Price Level; 2.25% Discount Rate)				
Category	Without-Project Damages	With- Project Damages	Damages Reduced	% of Total Benefits
HEC-FDA Categories	$1,541,270	$123,596	$1,417,670	99.3%
Water Supply	$267	$72	$195	0.0%
Boat Fleets	$32	$2	$30	0.0%
Avoided Structure-Raising Costs	$9,369	$0	$9,369	0.7%
Total	**$1,550,938**	**$123,670**	**$1,427,263**	**100%**
OMB Interest Rate (FY 2022 Price Level; 7% Discount Rate)				
Category	Without-Project Damages	With- Project Damages	Damages Reduced	% of Total Benefits
HEC-FDA Categories	$1,172,830	$114,757	$1,058,080	99.3%
Water Supply	$203	$67	$136	0.0%
Boat Fleets	$24	$2	$23	0.0%
Avoided Structure-Raising Costs	$7,129	$0	$7,129	0.7%
Total	**$1,180,187**	**$114,826**	**$1,065,368**	**100%**

Note: The values used for the PAC Report "HEC-FDA Categories" correspond to the following damage categories in the PAC Report analysis: Residendial & Commercial - Structure/Content/Vehicles, Industrial - Structure/Contents, Highways, Streets, and Debris Removal & Cleanup. All of these categories were analyzed previously in separate HEC-FDA models. For the economic update, all these categories are represented in one HEC-FDA model.

PART 4: LIFE CYCLE COSTS OF THE PROJECT ALTERNATIVE

CONSTRUCTION OF THE PROJECT ALTERNATIVE

Construction Schedule. Construction of the project alternative is scheduled to begin in the year 2022 and will continue through the year 2070 for the 1 percent AEP alternative. The authorized levee alignment for the alternative will be constructed using the existing non-Federal levee systems throughout the area whenever possible and will be constructed in phases due to the relatively poor foundation conditions and the absence of quality burrow material. The 1 percent AEP alternative requires two or three levee lifts, depending on the levee reach, to achieve the design elevation by the year 2035. Three additional levee lifts are scheduled after the year 2035 to maintain the design elevation. The first levee lifts will be overbuilt and allowed to settle for several years before the later levee lifts are added. The later lifts will account for the relative sea-level rise and subsidence that is projected to occur throughout the period of analysis. The life cycle costs also include the construction of sector gates and a lock structure on the HNC and the major periodic rehabilitation cost of these hurricane and storm damage risk reduction structures on navigable waterways.

Average Annual Costs. Life cycle cost estimates were provided for the 1 percent AEP alternative in October 2021 price levels. The first costs, along with the schedule of expenditures, were used to determine the interest during construction and gross investment cost at the end of the installation period. The FY22 Federal discount rate of 2.25 percent was used to discount the costs to the base year and then amortize the costs over the 50-year period of analysis. After the average annual construction costs were calculated, the annual operations and maintenance (O&M) costs were added.

Table 22 displays how the annual O&M cost from the PAC Report was brought to 2011 present value, indexed, and re-annualized at both the FY22 Federal discount rate of 2.25 percent and the OMB discount rate of 7 percent. Table 23a provides the life cycle costs for the 1 percent AEP alternative, the average annual construction cost, the annual operation and maintenance cost, and the total average annual cost using the FY22 Federal discount rate of 2.25 percent. Table 23b shows the same data using the OMB discount rate of 7 percent. Both tables have summaries of costs with and without sunk costs from years 2000 to 2021 to represent total cost and remaining cost.

Table 22
Morganza to the Gulf Economic Update
Price Indexing and Annualization of Operation and Maintenance Costs

Report	Present Value	Discount Rate	Amortization Factor	Average Annual O&M Cost
PAC Report (FY11)	$130,770,672	4%	0.04655	$6,087,401
Economic Update (FY22)	$164,992,449	2.25%	0.03352	$5,530,276
		7%	0.07246	$11,955,328

Note: The average annual O&M cost from the PAC Report was brought to present value using the amortization factor it was created with. That present value was then indexed using CWCCIS Levees & Floodwalls Yearly Cost Indices (EM 1110-2-1304 - 31 March 2021) from FY2011 (769.26) to FY2022 (970.57). The FY2022 present value was then annualized at both the current federal discount rate and the OMB discount rate.

Table 23a
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 2.25% Discount Rate)

Year	Analysis Year	Sunk Construction Costs (Nominal Price Level)	CWCCIS Index	Total Construction Costs	Present Value Factor	Present Value Cost
2000	-35.5	$ 0.35	1.89	$ 0.66	1.0000	$ 0.66
2001	-34.5	$ 1.72	1.87	$ 3.21	1.0000	$ 3.21
2002	-33.5	$ 4.35	1.81	$ 7.89	1.0000	$ 7.89
2003	-32.5	$ 6.53	1.77	$ 11.53	1.0000	$ 11.53
2004	-31.5	$ 5.52	1.65	$ 9.13	1.0000	$ 9.13
2005	-30.5	$ 3.21	1.56	$ 5.01	1.0000	$ 5.01
2006	-29.5	$ 1.93	1.48	$ 2.85	1.0000	$ 2.85
2007	-28.5	$ 2.97	1.42	$ 4.21	1.0000	$ 4.21
2008	-27.5	$ 8.84	1.34	$ 11.88	1.0000	$ 11.88
2009	-26.5	$ 5.34	1.35	$ 7.21	1.0000	$ 7.21
2010	-25.5	$ 6.84	1.32	$ 9.00	1.0000	$ 9.00
2011	-24.5	$ 5.23	1.26	$ 6.60	1.0000	$ 6.60
2012	-23.5	$ 3.93	1.23	$ 4.83	1.0000	$ 4.83
2013	-22.5	$ 1.73	1.21	$ 2.09	1.0000	$ 2.09
2014	-21.5	$ 0.76	1.18	$ 0.90	1.0000	$ 0.90
2015	-20.5	$ 0.47	1.17	$ 0.55	1.0000	$ 0.55
2016	-19.5	$ 0.18	1.16	$ 0.21	1.0000	$ 0.21
2017	-18.5	$ 0.18	1.13	$ 0.20	1.0000	$ 0.20
2018	-17.5	$ 0.02	1.11	$ 0.02	1.0000	$ 0.02
2019	-16.5	$ 0.06	1.07	$ 0.06	1.0000	$ 0.06
2020	-15.5	$ 0.46	1.05	$ 0.48	1.0000	$ 0.48
2021	-14.5			$ -	1.0000	$ -
2022	-13.5			$ 673.06	1.3504	$ 908.89
2023	-12.5			$ 81.09	1.3207	$ 107.09
2024	-11.5			$ 326.73	1.2916	$ 422.01
2025	-10.5			$ 159.23	1.2632	$ 201.13
2026	-9.5			$ 148.11	1.2354	$ 182.97
2027	-8.5			$ 100.60	1.2082	$ 121.55
2028	-7.5			$ 145.66	1.1816	$ 172.12
2029	-6.5			$ 193.36	1.1556	$ 223.44
2030	-5.5			$ 126.64	1.1302	$ 143.12
2031	-4.5			$ 394.20	1.1053	$ 435.72
2032	-3.5			$ 468.47	1.0810	$ 506.41

Table 23a
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 2.25% Discount Rate)

Year	Analysis Year	Sunk Construction Costs (Nominal Price Level)	CWCCIS Index	Total Construction Costs	Present Value Factor	Present Value Cost
2033	-2.5			$ 489.55	1.0572	$ 517.55
2034	-1.5			$ 377.27	1.0339	$ 390.08
2035	-0.5			$ 171.54	1.0112	$ 173.45
2036	0.5			$ 89.97	0.9889	$ 88.98
2037	1.5			$ 501.02	0.9672	$ 484.57
2038	2.5			$ 382.10	0.9459	$ 361.43
2039	3.5			$ 101.50	0.9251	$ 93.90
2040	4.5			$ 101.50	0.9047	$ 91.83
2041	5.5			$ 100.79	0.8848	$ 89.18
2042	6.5			$ 127.79	0.8653	$ 110.58
2043	7.5			$ 64.39	0.8463	$ 54.49
2044	8.5			$ 38.16	0.8277	$ 31.58
2045	9.5			$ 53.31	0.8095	$ 43.15
2046	10.5			$ 137.05	0.7917	$ 108.50
2047	11.5			$ 137.05	0.7742	$ 106.11
2048	12.5			$ 137.05	0.7572	$ 103.78
2049	13.5			$ 126.73	0.7405	$ 93.85
2050	14.5			$ 34.28	0.7242	$ 24.83
2051	15.5			$ -	0.7083	$ -
2052	16.5			$ -	0.6927	$ -
2053	17.5			$ -	0.6775	$ -
2054	18.5			$ -	0.6626	$ -
2055	19.5			$ -	0.6480	$ -
2056	20.5			$ -	0.6337	$ -
2057	21.5			$ -	0.6198	$ -
2058	22.5			$ -	0.6061	$ -
2059	23.5			$ -	0.5928	$ -
2060	24.5			$ -	0.5798	$ -
2061	25.5			$ -	0.5670	$ -
2062	26.5			$ -	0.5545	$ -
2063	27.5			$ -	0.5423	$ -
2064	28.5			$ -	0.5304	$ -
2065	29.5			$ 6.58	0.5187	$ 3.41

Table 23a (continued)
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 2.25% Discount Rate)

Year	Analysis Year	Sunk Construction Costs (Nominal Price Level)	CWCCIS Index	Total Construction Costs	Present Value Factor	Present Value Cost
2066	30.5			$ 93.43	0.5073	$ 47.40
2067	31.5			$ 113.45	0.4961	$ 56.28
2068	32.5			$ 113.45	0.4852	$ 55.05
2069	33.5			$ 99.09	0.4745	$ 47.02
2070	34.5			$ 47.58	0.4641	$ 22.08
2071	35.5			$ -	0.4539	$ -
2072	36.5			$ -	0.4439	$ -
2073	37.5			$ -	0.4341	$ -
2074	38.5			$ -	0.4246	$ -
2075	39.5			$ -	0.4152	$ -
2076	40.5			$ -	0.4061	$ -
2077	41.5			$ -	0.3972	$ -
2078	42.5			$ -	0.3884	$ -
2079	43.5			$ -	0.3799	$ -
2080	44.5			$ -	0.3715	$ -
2081	45.5			$ -	0.3633	$ -
2082	46.5			$ -	0.3553	$ -
2083	47.5			$ -	0.3475	$ -
2084	48.5			$ -	0.3399	$ -
2085	49.5			$ -	0.3324	$ -

Table 23a (continued)
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 2.25% Discount Rate)

Total Cost Summary				
		Cost		Present Value Cost
Sunk Costs:	$	89	$	89
Remaining Costs:	$	6,462	$	6,624
Total Costs:	$	6,550	$	6,712
		Discount Rate:	2.25%	
		Amortization Factor:	0.03352	
		Interest During Construction:	$	650
		Total Average Annual Construction Costs:	$	225
		Operations and Maintenance Cost:	$	6
		Total Annual Costs:	$	231

Remaining Cost Summary				
		Cost		Present Value Cost
Remaining Costs:	$	6,462	$	6,624
		Discount Rate:	2.25%	
		Amortization Factor:	0.03352	
		Interest During Construction:	$	650
		Remaining Average Annual Construction Costs:	$	222
		Operations and Maintenance Cost:	$	6
		Remaining Annual Costs:	$	228

Note: All costs pior to 2021 are considered sunk. Sunk costs were indexed for 2022 price levels using the yearly Civil Works Construction Cost Index dated 31 March 2021 Levees and Floodwalls.

Table 23b
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 7% Discount Rate)

Year	Analysis Year	Sunk Construction Costs (Nominal Price Level)	CWCCIS Index	Total Construction Costs	Present Value Factor	Present Value Cost
2000	-35.5	$ 0.35	1.89	$ 0.66	1.0000	$ 0.66
2001	-34.5	$ 1.72	1.87	$ 3.21	1.0000	$ 3.21
2002	-33.5	$ 4.35	1.81	$ 7.89	1.0000	$ 7.89
2003	-32.5	$ 6.53	1.77	$ 11.53	1.0000	$ 11.53
2004	-31.5	$ 5.52	1.65	$ 9.13	1.0000	$ 9.13
2005	-30.5	$ 3.21	1.56	$ 5.01	1.0000	$ 5.01
2006	-29.5	$ 1.93	1.48	$ 2.85	1.0000	$ 2.85
2007	-28.5	$ 2.97	1.42	$ 4.21	1.0000	$ 4.21
2008	-27.5	$ 8.84	1.34	$ 11.88	1.0000	$ 11.88
2009	-26.5	$ 5.34	1.35	$ 7.21	1.0000	$ 7.21
2010	-25.5	$ 6.84	1.32	$ 9.00	1.0000	$ 9.00
2011	-24.5	$ 5.23	1.26	$ 6.60	1.0000	$ 6.60
2012	-23.5	$ 3.93	1.23	$ 4.83	1.0000	$ 4.83
2013	-22.5	$ 1.73	1.21	$ 2.09	1.0000	$ 2.09
2014	-21.5	$ 0.76	1.18	$ 0.90	1.0000	$ 0.90
2015	-20.5	$ 0.47	1.17	$ 0.55	1.0000	$ 0.55
2016	-19.5	$ 0.18	1.16	$ 0.21	1.0000	$ 0.21
2017	-18.5	$ 0.18	1.13	$ 0.20	1.0000	$ 0.20
2018	-17.5	$ 0.02	1.11	$ 0.02	1.0000	$ 0.02
2019	-16.5	$ 0.06	1.07	$ 0.06	1.0000	$ 0.06
2020	-15.5	$ 0.46	1.05	$ 0.48	1.0000	$ 0.48
2021	-14.5			$ -	1.0000	$ -
2022	-13.5			$ 673.06	2.4928	$ 1,677.78
2023	-12.5			$ 81.09	2.3297	$ 188.90
2024	-11.5			$ 326.73	2.1773	$ 711.38
2025	-10.5			$ 159.23	2.0348	$ 324.00
2026	-9.5			$ 148.11	1.9017	$ 281.66
2027	-8.5			$ 100.60	1.7773	$ 178.80
2028	-7.5			$ 145.66	1.6610	$ 241.95
2029	-6.5			$ 193.36	1.5524	$ 300.16
2030	-5.5			$ 126.64	1.4508	$ 183.73
2031	-4.5			$ 394.20	1.3559	$ 534.50
2032	-3.5			$ 468.47	1.2672	$ 593.64

Table 23b
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 7% Discount Rate)

Year	Analysis Year	Sunk Construction Costs (Nominal Price Level)	CWCCIS Index	Total Construction Costs	Present Value Factor	Present Value Cost
2033	-2.5			$ 489.55	1.1843	$ 579.77
2034	-1.5			$ 377.27	1.1068	$ 417.57
2035	-0.5			$ 171.54	1.0344	$ 177.44
2036	0.5			$ 89.97	0.9667	$ 86.98
2037	1.5			$ 501.02	0.9035	$ 452.67
2038	2.5			$ 382.10	0.8444	$ 322.64
2039	3.5			$ 101.50	0.7891	$ 80.10
2040	4.5			$ 101.50	0.7375	$ 74.86
2041	5.5			$ 100.79	0.6893	$ 69.47
2042	6.5			$ 127.79	0.6442	$ 82.32
2043	7.5			$ 64.39	0.6020	$ 38.77
2044	8.5			$ 38.16	0.5626	$ 21.47
2045	9.5			$ 53.31	0.5258	$ 28.03
2046	10.5			$ 137.05	0.4914	$ 67.35
2047	11.5			$ 137.05	0.4593	$ 62.95
2048	12.5			$ 137.05	0.4292	$ 58.83
2049	13.5			$ 126.73	0.4012	$ 50.84
2050	14.5			$ 34.28	0.3749	$ 12.85
2051	15.5			$ -	0.3504	$ -
2052	16.5			$ -	0.3275	$ -
2053	17.5			$ -	0.3060	$ -
2054	18.5			$ -	0.2860	$ -
2055	19.5			$ -	0.2673	$ -
2056	20.5			$ -	0.2498	$ -
2057	21.5			$ -	0.2335	$ -
2058	22.5			$ -	0.2182	$ -
2059	23.5			$ -	0.2039	$ -
2060	24.5			$ -	0.1906	$ -
2061	25.5			$ -	0.1781	$ -
2062	26.5			$ -	0.1665	$ -
2063	27.5			$ -	0.1556	$ -
2064	28.5			$ -	0.1454	$ -
2065	29.5			$ 6.58	0.1359	$ 0.89

Table 23b (continued)
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 7% Discount Rate)

Year	Analysis Year	Sunk Construction Costs (Nominal Price Level)	CWCCIS Index	Total Construction Costs	Present Value Factor	Present Value Cost
2066	30.5			$ 93.43	0.1270	$ 11.87
2067	31.5			$ 113.45	0.1187	$ 13.46
2068	32.5			$ 113.45	0.1109	$ 12.58
2069	33.5			$ 99.09	0.1037	$ 10.27
2070	34.5			$ 47.58	0.0969	$ 4.61
2071	35.5			$ -	0.0905	$ -
2072	36.5			$ -	0.0846	$ -
2073	37.5			$ -	0.0791	$ -
2074	38.5			$ -	0.0739	$ -
2075	39.5			$ -	0.0691	$ -
2076	40.5			$ -	0.0646	$ -
2077	41.5			$ -	0.0603	$ -
2078	42.5			$ -	0.0564	$ -
2079	43.5			$ -	0.0527	$ -
2080	44.5			$ -	0.0493	$ -
2081	45.5			$ -	0.0460	$ -
2082	46.5			$ -	0.0430	$ -
2083	47.5			$ -	0.0402	$ -
2084	48.5			$ -	0.0376	$ -
2085	49.5			$ -	0.0351	$ -

Table 23b (continued)
Morganza to the Gulf Economic Update
Morganza to the Gulf
1% AEP Alternative Total Annual Costs
(2022 Price Level; $ Millions; 7% Discount Rate)

Total Cost Summary		
	Cost	Present Value Cost
Sunk Costs:	$ 89	$ 89
Remaining Costs:	$ 6,462	$ 7,955
Total Costs:	$ 6,550	$ 8,044
	Discount Rate: 7.00%	
	Amortization Factor: 0.07246	
	Interest During Construction:	$ 2,536
	Total Average Annual Construction Costs:	$ 583
	Operations and Maintenance Cost:	$ 12
	Total Annual Costs:	$ 595

Remaining Cost Summary		
	Cost	Present Value Cost
Remaining Costs:	$ 6,462	$ 7,955
	Discount Rate: 7.00%	
	Amortization Factor: 0.07246	
	Interest During Construction:	$ 2,536
	Remaining Average Annual Construction Costs:	$ 576
	Operations and Maintenance Cost:	$ 12
	Remaining Annual Costs:	$ 588

Note: All costs pior to 2021 are considered sunk. Sunk costs were indexed for 2022 price levels using the yearly Civil Works Construction Cost Index dated 31 March 2021 Levees and Floodwalls.

PART 5: RESULTS OF THE ECONOMIC ANALYSIS

NET BENEFIT ANALYSIS

Calculation of Net Benefits. The expected annual benefits attributable to the 1 percent AEP alternative for each of the benefit categories were converted to an equivalent time frame by using both the current Federal discount rate of 2.25 percent and the OMB discount rate of 7 percent. The base year for this conversion is the year. The equivalent annual benefits were then compared to the average annual costs to develop a benefit-to-cost ratio for each interest rate scenario. The net benefits for each alternative were calculated by subtracting the average annual costs from the equivalent annual benefits. Table 24a summarizes the equivalent annual damages and benefits, total first costs (including sunk and remaining costs), total annual costs, benefit-to-cost ratio, and equivalent annual net benefits at the current Federal discount rate. Table 24b summarizes the same, but using only remaining costs. Tables 25a and 25b show the same at the OMB discount rate.

Table 24a
Morganza to the Gulf Economic Update
Total Equivalent Annual Net Benefits at Federal Discount Rate
(2022 Price Level; $ Millions; 2.25% Discount Rate)

Item	Equivalent Annual		
	Without-Project Damages	With-Project Damages	Benefits and Costs
Damage Category			
Structures, Contents, Autos, Debris, Transportation			
Infrastructure	$1,541	$124	$1,418
Water Supply	$0	$0	$0
Boat Fleets	$0	$0	$0
Avoided Structure-Raising Costs	$9	$0	$9
Total	$1,551	$124	$1,427
		Sunk Costs	$89
		Remaining Costs	$6,462
		Total First Costs	$6,550
		Interest During Construction	$650
		Total Average Annual Construction Costs	$225
		Annual Operation & Maintenance Costs	$6
		Total Average Annual Project Costs	$231
		B/C Ratio	6.19
		Total Equivalent Annual Net Benefits	$1,197

Table 24b
Morganza to the Gulf Economic Update
Remaining Equivalent Annual Net Benefits at Federal Discount Rate
(2022 Price Level; $ Millions; 2.25% Discount Rate)

Item	Equivalent Annual		
	Without-Project Damages	With-Project Damages	Benefits and Costs
Damage Category			
Structures, Contents, Autos, Debris, Transportation			
Infrastructure	$1,541	$124	$1,418
Water Supply	$0	$0	$0
Boat Fleets	$0	$0	$0
Avoided Structure-Raising Costs	$9	$0	$9
Total	$1,551	$124	$1,427
		Remaining Costs	$6,462
		Interest During Construction	$650
		Remaining Average Annual Construction Costs	$222
		Annual Operation & Maintenance Costs	$6
		Remaining Average Annual Project Costs	$228
		B/C Ratio	6.27
		Remaining Equivalent Annual Net Benefits	$1,200

Table 25a
Morganza to the Gulf Economic Update
Total Equivalent Annual Net Benefits at OMB Discount Rate
(2022 Price Level; $ Millions; 7% Discount Rate)

Item	Equivalent Annual		
	Without-Project Damages	With-Project Damages	Benefits and Costs
Damage Category			
Structures, Contents, Autos, Debris, Transportation			
Infrastructure	$1,173	$115	$1,058
Water Supply	$0	$0	$0
Boat Fleets	$0	$0	$0
Avoided Structure-Raising Costs	$7	$0	$7
Total	$1,180	$115	$1,065
		Sunk Costs	$89
		Remaining Costs	$6,462
		Total First Costs	$6,550
		Interest During Construction	$2,536
		Total Average Annual Construction Costs	$583
		Annual Operation & Maintenance Costs	$12
		Total Average Annual Project Costs	$595
		B/C Ratio	1.79
		Total Equivalent Annual Net Benefits	$471

Table 25b
Morganza to the Gulf Economic Update
Remaining Equivalent Annual Net Benefits at OMB Discount Rate
(2022 Price Level; $ Millions; 7% Discount Rate)

Item	Equivalent Annual		
	Without-Project Damages	With-Project Damages	Benefits and Costs
Damage Category			
Structures, Contents, Autos, Debris, Transportation			
Infrastructure	$1,173	$115	$1,058
Water Supply	$0	$0	$0
Boat Fleets	$0	$0	$0
Avoided Structure-Raising Costs	$7	$0	$7
Total	$1,180	$115	$1,065
		Remaining Costs	$6,462
		Interest During Construction	$2,536
		Remaining Average Annual Construction Costs	$576
		Annual Operation & Maintenance Costs	$12
		Remaining Average Annual Project Costs	$588
		B/C Ratio	1.81
		Remaining Equivalent Annual Net Benefits	$477

RISK ANALYSIS AND PROJECT PERFORMANCE

Benefit Exceedance Probability Relationship. The HEC-FDA model incorporates the uncertainty surrounding the economic and engineering inputs to generate results that can be used to assess the performance of proposed plans. The HEC-FDA model was used to calculate equivalent annual without-project and with-project damages and the damages reduced for the 1 percent AEP alternative. Table 26 shows the equivalent annual benefits and the benefits at the 75, 50, and 25 percentiles for the 50-year period of analysis at the Federal discount rate. The percentiles shown in the tables reflect the percentage chance that the benefits will be greater than or equal to the indicated values. Since the additional benefit categories were not calculated in HEC-FDA, the values associated with these percentiles were scaled based on the results from the model. Finally, the benefit exceedance probability relationships are compared to the point estimate of the annual costs to show the percentage chance that the equivalent annual benefits will exceed the annual costs at the Federal discount rate. Table 27 shows the same data using the OMB discount rate.

Table 26
Morganza to the Gulf Economic Update
Probability Equivalent Annual Benefits Exceed Total Annual Costs at Federal Discount Rate
(2022 Price Level; 2.25% Discount Rate; $ Thousands)

Damage Category	Equivalent Annual Damages Reduced	Probability Damage Reduced Exceeds Values			Total Annual Costs	Probabilty Benefits Exceed Costs
		75%	50%	25%		
HEC-FDA Categories	$1,417,670	$1,028,380	$1,391,950	$1,779,190	$230,507	Greater than 75%
Water Supply	$195	$141	$191	$245		
Boat Fleets	$30	$22	$29	$38		
Avoided Structure-Raising Costs	$9,369	$6,796	$9,199	$11,758		
Total Benefits	$1,427,263	$1,035,339	$1,401,369	$1,791,230		

Table 27
Morganza to the Gulf Economic Update
Probability Equivalent Annual Benefits Exceed Total Annual Costs at OMB Discount Rate
(2022 Price Level; 7% Discount Rate; $ Thousands)

Damage Category	Equivalent Annual Damages Reduced	Probability Damage Reduced Exceeds Values			Total Annual Costs	Probabilty Benefits Exceed Costs
		75%	50%	25%		
HEC-FDA Categories	$1,058,080	$737,305	$1,031,040	$1,350,750	$594,796	Greater than 75%
Water Supply	$136	$95	$133	$174		
Boat Fleets	$23	$16	$22	$29		
Avoided Structure-Raising Costs	$7,129	$4,968	$6,947	$9,101		
Total Benefits	$1,065,368	$742,383	$1,038,141	$1,360,054		

Project Performance by Reach for the Years of Analysis. The results from the HEC-FDA model were also used to calculate the long-term AEP and the conditional non-exceedance probability, or assurance, for various probability events. The model provided a target stage to assess project performance for each study area reach for the analysis years 2035 and 2085 for the without-project condition and for the 1 percent AEP alternative. For each study area reach, the target stage was set by default at the elevation where the model calculated five percent residual damages for the 1 percent AEP (100-year) event.

The HEC-FDA model calculated a target stage AEP with a median and expected value that reflected the likelihood that the target stages will be exceeded in a given year. The median value was calculated using point estimates, while the expected value was calculated using Monte Carlo simulation. The results also show the long-term risk or the probability of a target stage being exceeded over 10-year, 30-year, and 50-year periods. Finally, the model results show the conditional non-exceedance probability or the likelihood that a target stage will not be exceeded by the 10 percent (10 year) AEP, 4 percent (25-year), 2 percent (50-year), 1 percent (100-year), the 0.04 percent (250-year), and 0.02 percent (500-year) AEP events. Tables 28 and 29, available at the end of this appendix, display the project performance results for the categories analyzed using the HEC-FDA model for each study area reach for the analysis years 2035 and 2085 for both the without-project and with-project conditions.

Residual Risk. Any flood risk to either existing or future development that remains in the floodplain after the implementation of the 1 percent AEP alternative is considered residual risk. The total equivalent annual residual damages by category are shown in Table 30. The values are shown using both the Federal discount rate and the OMB discount rate.

Table 30
Morganza to the Gulf Economic Update
Residual Equivalent Annual Damages by Category
($ Thousands; FY22 Price Level)

FY 2022 Federal Interest Rate of 2.25%		
Category	Residual Damages	Residual Damages
Residential	$59,896	48%
Mobile Homes	$2,321	2%
Commercial	$49,169	40%
Industrial	$2,535	2%
Interviewed Industrial	$2,287	2%
Vehicles	$3,276	3%
Streets	$3,265	3%
Highways	$817	1%
Railroads	$31	0%
Water Supply	$72	0%
Boat Fleets	$2	0%
Avoided Structure-Raising Costs	$0	0%
Total	**$123,671**	100%
OMB Interest Rate of 7%		
Category	Residual Damages	% of Total Residual Damages
Residential	$56,032	49%
Mobile Homes	$2,179	2%
Commercial	$45,171	39%
Industrial	$2,271	2%
Interviewed Industrial	$2,238	2%
Vehicles	$3,089	3%
Streets	$3,017	3%
Highways	$737	1%
Railroads	$23	0%
Water Supply	$67	0%
Boat Fleets	$2	0%
Avoided Structure-Raising Costs	$0	0%
Total	**$114,826**	100%

PART 6: POST AUTHORIZATION CHANGES

CHANGES SINCE THE PAC REPORT

Changes in Structure Inventory. At the time of the PAC report, a structure inventory representing estimated future development was used in the damage analysis for the final authorized project. Since the majority of the area previously designated for future development has already been developed, the inventory was supplemented as described in the narrative above. Table 31 shows a comparison between the full structure inventory from the PAC report (including future development, which accounted for about 20 percent of the total inventory) at both 2011 and 2022 price levels and the structure inventory used in this economic update.

Table 31
Morganza to the Gulf Economic Update
Structure Inventory Compairson

Structure Occupancy	PAC Report Inventory (2011 Price Level)			PAC Report Inventory (2022 Price Level)		Economic Update Inventory (2022 Price Level)		
	Number of Structures	Total Depreciated Replacement Value ($ Millions)	Average Depreciated Replacement Value ($ Thousands)	Total Depreciated Replacement Value ($ Millions)	Average Depreciated Replacement Value ($ Thousands)	Number of Structures	Total Depreciated Replacement Value ($ Millions)	Average Depreciated Replacement Value ($ Thousands)
Residential								
One-Story Slab	29,527	$4,749	$161	$6,300	$213	27,618	$6,520	$236
One-Story Pier	16,290	$1,437	$88	$1,906	$117	15,435	$2,159	$140
Two-Story Slab	2,121	$448	$211	$594	$280	3,640	$1,083	$297
Two-Story Pier	811	$112	$138	$149	$183	1,516	$315	$208
Mobile Home	13,145	$124	$9	$164	$13	12,607	$218	$17
Total Residential	**61,894**	**$6,870**	**$111**	**$9,113**	**$147**	**60,816**	**$10,294**	**$169**
Non-Residential								
Eating and Recreation	970	$351	$362	$465	$480	387	$196	$506
Professional	1,933	$1,332	$689	$1,768	$914	1,503	$1,320	$878
Public and Semi-Public	812	$658	$810	$872	$1,074	779	$949	$1,219
Repair and Home Use	246	$41	$168	$55	$223	276	$117	$424
Retail and Personal Services	958	$540	$564	$716	$748	744	$649	$872
Warehouse	5,288	$950	$180	$1,261	$238	3,220	$1,018	$316
Grocery and Gas Station	238	$83	$349	$110	$463	144	$79	$546
Multi-Family Occupancy	419	$223	$533	$296	$707	410	$325	$792
Interviewed Industrial	24	$43	$2	$57	$2,365	24	$67	$2,790
Total Non-Residential	**10,864**	**$4,179**	**$385**	**$5,544**	**$510**	**7,487**	**$4,720**	**$630**
Totals								
	72,758	**$11,049**		**$14,657**		**68,303**	**$15,014**	

Note: PAC Report inventory includes future deveolpment (about 20% of total inventory) and was indexed using the RSMeans 2021 Historical Cost Index (2011 at 162.1 and 2021 at 204.8) and the Consumer Price Index for 2021 to 2022 (5%)

Table 32 provides the project first cost comparisons of the latest authorization PAC (at 2012 price levels) and current first costs (2022 price levels).

Table 32
Morganza to the Gulf Economic Update
Project First Cost Comparison
($ Millions)

Project as Authorized by Congress		Current Project First Costs (2022 Price Level)	Current Project Fully Funded First Cost (2022 Price Level)
(2012 Price Level)	(2022 Price Level)		
$10,265	$12,629.13	$6,550	$10,148

Note: Authorized cost pulled from PAC Report Table 55 and indexed using CWCCIS Yearly Cost Indices for feature code 11 Levees & Floodwalls

Changes in Project BCR and Net Benefits. The existing project benefits result from flood damage reduction as a result of the proposed levee system. Table 33 shows all components of the net benefit analysis for the project as authorized by Congress in the PAC report at both the 2012 price level and an indexed 2022 price level compared to the current economic update net benefit analysis at a 2022 price level using both the current Federal discount rate of 2.25 percent and the OMB discount rate of 7 percent.

Table 33
Morganza to the Gulf Economic Update
Damages, Benefits, Costs, and BCR Comparison
($ Millions)

Item	PAC Report - Project As Authroized by Congress		Economic Update - Total Cost		Economic Update - Remaining Cost	
Price Level	2012	2022	2022	2022	2022	2022
Interest Rate	3.75	3.75	2.25	7.00	2.25	7.00
Total Equivalent Annual Without-Project Damages	$906	$1,134	$1,551	$1,180	$1,551	$1,180
Total Equivalent Annual With-Project Damages	$136	$170	$124	$115	$124	$115
Total Equivalent Annual Benefits	$1,023	$1,282	$1,427	$1,065	$1,427	$1,065
First Costs	$10,265	$12,629	$6,550	$6,550	$6,462	$6,462
Interest During Construction	$5,914	$7,276	$650	$2,536	$650	$2,536
Annual Operation & Maintenance Costs	$7	$9	$6	$12	$6	$12
Total Annual Costs	$716	$881	$231	$595	$228	$588
B/C Ratio	1.43	1.45	6.19	1.79	6.27	1.81
Equivalent Annual Net Benefits	$307	$401	$1,197	$471	$1,200	$477

Note: PAC Report values were indexed using RSMeans from 2021 to 2021 (2012 171.7 and 2021 204.8E) and the Consumer Price Index from 2021 to 2022 (5%) on the damages and benefits. Costs were indexed using CWCCIS (FY12 788.89 and FY22 970.57)

Referenced Tables

Table 7
Morganza to the Gulf Economic Update
Number of Structures by Reach and Category

Reach Name	Station Number	Residential	Mobile Homes	Commercial	Industrial	Interviewed Industrial	Vehicles	Structure Total
1-1AB	1	41	81	148	3	0	263	273
1-1AN	4	1,122	441	242	3	0	2,109	1,808
11BE1	7	300	253	11	2	0	553	566
11BE2	10	228	47	18	2	0	274	295
11BE3	13	256	368	38	1	0	606	663
11BE4	16	168	116	69	1	0	282	354
11BE5	19	74	106	44	0	0	505	224
11BE6-E	22	0	1	2	0	0	1	3
11BE6-W	25	1	145	25	0	0	146	171
1-1BU3-U1	28	295	76	38	0	0	746	409
1-1BU3-U2	31	180	13	8	0	0	193	201
1-1BU3-U3	34	41	0	6	1	0	41	48
11BU4	37	277	36	14	3	0	313	330
11BW11	40	91	43	38	0	0	129	172
11BW2-W1	43	100	20	6	2	0	120	128
11BW2-W2	46	436	150	12	0	0	586	598
11BW4-W3	49	9	13	4	0	0	22	26
11BW4-W4	52	672	87	29	0	0	955	788
11BW4-W4A	55	296	5	12	0	0	299	313
11BW5	58	1,575	1	54	0	0	2,326	1,630
11BW6	61	762	9	81	0	0	1,971	852
11BW79	64	1,570	35	89	0	0	1,605	1,694
11BW79-W7	67	767	67	120	0	0	1,159	954
1-2MID	70	1	0	62	1	0	1	64
1-2N	73	210	34	94	0	0	259	338
1-2S	76	1	1	28	2	0	2	32
1-3	79	1,008	84	53	3	0	1,405	1,148
1-5	82	2,501	321	379	2	1	2,822	3,204
1-7_N3-4	85	16	0	2	0	0	16	18
1-7_N4-7	88	35	0	3	0	0	35	38
1-7_N7-10	91	68	0	3	0	0	68	71
1-7-N10-13	94	87	3	7	0	0	88	97
1-7N13-16	97	38	4	33	0	0	40	75
1-7N16-17	100	0	0	2	0	0	0	2
1-7N17-24	103	43	1	36	0	0	44	80
1-7N24-28	106	217	4	22	0	0	221	243
1-8	109	337	44	221	0	0	767	602
2-1A2	112	3	0	2	0	0	3	5
2-1B2-MID	115	6	1	2	0	0	7	9
2-1B2N	118	88	2	8	0	0	90	98
2-1B2S	121	1,254	19	272	11	0	1,473	1,556
3-1B	124	249	32	20	0	0	281	301
3-1C	127	74	21	6	0	0	95	101
4-1N	130	174	39	13	0	0	213	226
4-1S	133	162	88	10	0	0	250	260
4-2	136	460	134	11	0	0	594	605
4-2A	139	347	317	23	0	0	658	687
4-2B	142	120	118	11	0	0	238	249
4-2C	145	102	27	5	0	0	129	134
4-7	148	205	36	16	0	0	241	257
4MGT	151	194	78	9	0	0	270	281

Table 7 (continued)
Morganza to the Gulf Economic Update
Number of Structures by Reach and Category

Reach Name	Station Number	Residential	Mobile Homes	Commercial	Industrial	Interviewed Industrial	Vehicles	Structure Total
5-1A	154	855	197	39	0	0	1,052	1,091
5-1B	157	497	105	38	0	0	602	640
6-1B1	160	8	0	2	0	0	8	10
6-1B1-B	163	2	1	0	0	0	3	3
8-1N	166	15	5	3	0	0	18	23
8-1N-B	169	39	12	1	0	0	51	52
8-1S-B	175	122	42	10	0	0	164	174
8-2C	178	1	0	2	1	0	1	4
8-2D	181	57	24	3	0	0	81	84
9-1AE	184	136	44	6	3	0	180	189
9-1AMID	187	15	2	3	1	0	17	21
9-1AW	190	80	29	4	1	0	134	114
9-1BE	193	371	129	102	15	0	1,075	617
9-1BMIDE	196	2,040	116	25	0	0	2,181	2,181
9-1BMIDW	199	141	198	19	3	0	414	361
9-1BW	202	1,288	274	69	12	0	1,837	1,643
A1	205	118	231	26	5	0	349	380
B1	208	12	11	2	0	0	23	25
BB1	211	145	1	8	0	0	171	154
BB2	214	4	0	10	0	0	3	14
BB3	217	16	4	49	0	0	45	69
BB4	220	6	0	0	0	0	6	6
BB5	223	391	0	2	0	0	391	393
BB6	226	8	6	3	0	0	14	17
BB7	229	121	104	45	2	0	225	272
BB8-B	235	0	6	47	0	0	6	53
BD1	238	64	21	4	0	0	85	89
BDL0	241	13	50	1	0	0	61	64
BDL1	244	19	4	1	0	0	23	24
BDL2	247	4	0	0	0	0	4	4
BDL3	250	86	30	5	1	0	116	122
BDL4	253	66	0	3	0	0	66	69
BDL4-B	256	53	14	8	0	0	92	75
BDL5	259	35	10	19	0	0	45	64
BGC0	262	24	78	12	0	0	82	114
BGC1	265	24	8	2	0	0	32	34
BGC2	268	28	11	3	0	0	39	42
BGC3	271	135	47	27	0	0	178	209
BGC4	274	51	31	46	1	0	76	129
BL1	277	1	10	7	0	0	11	18
BL2	280	174	22	36	0	0	196	232
BL3	283	105	16	24	0	0	121	145
BL4	286	64	33	21	0	0	97	118
BL5	289	507	191	119	0	0	698	817
BL6	292	1,419	431	99	0	0	1,924	1,949
BL7	295	1,560	146	229	0	0	2,104	1,935
BL89	298	1,922	525	233	0	0	3,293	2,680
BPC1	301	349	12	3	0	0	361	364
BPC2	304	54	35	7	0	0	89	96
BPC3	307	114	58	13	0	1	172	186
BPC4	310	54	18	18	0	0	72	90

Table 7 (continued)
Morganza to the Gulf Economic Update
Number of Structures by Reach and Category

Reach Name	Station Number	Residential	Mobile Homes	Commercial	Industrial	Interviewed Industrial	Vehicles	Structure Total
BPC5	313	263	35	9	0	0	298	307
BPC5-B	316	210	23	39	0	0	233	272
BT1	319	492	45	119	2	0	562	658
BT10	322	41	0	16	1	0	116	58
BT2	325	107	26	3	1	0	129	137
BT3	328	17	3	6	0	0	20	26
BT4	331	98	72	15	0	0	168	185
BT4-SA	334	55	6	3	0	0	61	64
BT5	337	10	0	4	0	0	10	14
BT5-B	340	14	0	0	0	0	14	14
BT6	343	405	25	238	0	0	528	668
BT6A	346	271	41	162	0	0	400	474
BT7	349	149	49	74	0	0	348	272
BT8	352	207	25	56	5	0	282	293
BT9	355	142	45	89	6	0	387	282
C1	358	26	9	5	0	0	35	40
C1-LF	361	7	1	2	0	0	8	10
CC1	364	67	71	8	0	0	138	146
D-01	367	20	10	0	0	0	30	30
D-06	370	21	9	1	0	0	30	31
D10	373	28	12	5	0	0	40	45
D-16N	376	38	35	7	0	0	73	80
D-16S	379	150	128	9	0	0	278	287
D-1732	382	122	87	13	0	0	209	222
D1A	385	0	0	0	0	0	0	0
D1B	388	0	0	0	0	0	0	0
D1b-LF	391	2	1	4	1	0	3	8
D1C	394	12	9	10	0	0	21	31
D1c-LF1	397	185	109	29	0	0	294	323
D1c-LF2	400	151	65	20	0	0	216	236
D1c-LF3	403	6	1	4	0	0	7	11
D-25	406	116	29	24	0	0	145	169
D-25-B	409	0	0	0	0	0	0	0
D-26	412	48	2	2	0	0	50	52
D-28	415	434	224	26	11	0	683	695
D-29	418	1,601	1	65	1	0	1,702	1,668
D-30	421	32	2	1	0	0	34	35
D-31	424	12	6	3	0	0	18	21
D-34N	427	19	0	5	0	0	19	24
D-34S	430	6	1	2	0	0	7	9
D-35	433	7	0	2	0	0	7	9
D-36	436	136	98	6	0	0	234	240
D-37	439	62	0	0	0	0	62	62
D-38	442	277	0	23	0	0	627	300
D-39-1	445	300	14	30	0	0	314	344
D-39-2	448	67	1	22	0	0	293	90
D-39-3	451	184	3	70	0	0	212	257
D-42	454	28	30	3	1	0	58	62
D-43	457	153	43	11	0	0	184	207
D-44	460	3	74	6	0	0	102	83
D-45	463	5	0	0	0	0	5	5

Table 7 (continued)
Morganza to the Gulf Economic Update
Number of Structures by Reach and Category

Reach Name	Station Number	Residential	Mobile Homes	Commercial	Industrial	Interviewed Industrial	Vehicles	Structure Total
D-48	466	8	3	0	0	0	11	11
D-49	469	0	5	0	0	0	5	5
D-50	472	30	35	6	0	0	65	71
D-51	475	47	2	2	0	0	49	51
D-53	478	87	0	6	0	0	87	93
D-56	481	70	13	5	0	0	83	88
D-60	484	0	458	5	0	0	458	463
D-61	487	43	28	1	0	0	71	72
D-61-B	490	2	0	0	0	0	2	2
D-62-B	496	26	3	2	0	0	29	31
D-64	499	94	0	0	0	0	94	94
E1	502	5	21	14	0	0	26	40
E1-LF	505	0	1	0	0	0	1	1
E1-LF-B	508	0	0	8	0	0	0	8
E2	511	0	0	1	0	0	0	1
E2-B	514	0	0	4	0	0	0	4
E2-LF	517	142	81	76	0	0	223	299
FC	523	0	0	1	0	0	0	1
GW10	526	589	4	38	0	1	618	632
GW11	529	56	0	14	0	0	56	70
GW12	532	982	48	147	0	0	1,103	1,177
GW13	535	288	456	65	0	2	744	811
GW14	538	833	39	115	0	1	1,497	988
GW14-1	541	32	13	13	0	0	45	58
GW15	544	133	156	22	0	0	289	311
GW16	547	31	64	7	0	0	95	102
GW17	550	0	0	13	0	0	0	13
GW18	553	52	0	2	0	0	52	54
GW18-B	556	0	1	0	0	0	1	1
GW2	559	22	7	1	0	0	29	30
GW3	562	21	19	12	0	0	40	52
GW4	565	0	4	1	0	0	4	5
GW5	568	0	4	0	0	0	4	4
GW6	571	0	10	0	0	0	10	10
GW7	574	0	4	0	0	0	4	4
GW8	577	0	2	0	0	0	2	2
GW9	580	24	7	16	0	0	31	47
HC1	583	101	132	19	0	0	233	252
HC2	586	0	0	2	0	0	0	2
HC3	589	46	51	9	0	0	97	106
HC4	592	7	0	3	0	0	7	10
HNC0	595	2	3	76	1	0	5	82
HNC1	598	34	12	10	0	0	42	56
HNC10	601	14	3	1	0	0	17	18
HNC10-B	604	89	26	9	0	0	115	124
HNC2	607	143	58	22	0	0	197	223
HNC3	610	61	37	13	0	0	98	111
HNC4	613	27	8	1	0	0	35	36
HNC5	616	64	116	5	0	0	172	185
HNC6	619	1	9	54	3	0	10	67
HNC7	622	36	10	262	9	15	42	332

Table 7 (continued)
Morganza to the Gulf Economic Update
Number of Structures by Reach and Category

Reach Name	Station Number	Residential	Mobile Homes	Commercial	Industrial	Interviewed Industrial	Vehicles	Structure Total
HNC8	625	61	3	13	1	1	64	79
HNC9	628	0	0	0	0	0	0	0
HNC9-B	631	142	29	7	0	0	171	178
HNC9-E	634	6	9	0	0	0	15	15
HNC9-W	637	7	4	7	0	0	9	18
LB2	643	9	15	7	0	2	24	33
LB3	646	0	0	3	0	0	0	3
LB4	649	32	263	17	0	0	295	312
LB5	652	34	17	12	0	0	51	63
LBB2	655	2	0	3	0	0	2	5
LBB3	658	64	9	8	1	0	73	82
LBB4	661	106	3	144	0	0	109	253
LBB5	664	623	0	37	0	0	648	660
LBB6	667	88	0	35	0	0	88	123
LBC1	670	0	0	1	0	0	0	1
LBC2	673	0	0	3	0	0	0	3
LF1	676	24	0	11	0	0	24	35
LF2	679	13	1	4	0	0	14	18
LF-GB	682	0	5	9	0	0	5	14
LL1	685	3	0	0	0	0	3	3
LL3	691	0	1	0	0	0	1	1
MC1	694	0	0	0	0	0	0	0
OB1	697	183	17	6	2	0	200	208
OB2	700	43	74	5	3	0	117	125
OB3	703	21	13	11	0	0	184	45
OB4	706	56	0	3	0	0	56	59
PAC1	709	34	2	7	0	0	36	43
SL1	712	58	36	12	0	0	94	106
SL2	715	20	0	2	0	0	20	22
SL3	718	140	55	8	0	0	195	203
TS1	721	604	60	237	11	0	1,164	912
TS10	724	75	41	8	0	0	116	124
TS11	727	88	1	19	2	0	89	110
TS12	730	27	25	23	0	0	52	75
TS13	733	13	6	4	0	0	19	23
TS14	736	0	3	0	0	0	3	3
TS15	739	332	323	5	2	0	655	662
TS16	742	484	261	7	2	0	745	754
TS17	745	34	4	1	0	0	38	39
TS18	748	14	0	0	0	0	14	14
TS19	751	459	215	31	0	0	674	705
TS2	754	878	62	41	9	0	965	990
TS20	757	5	1	1	0	0	6	7
TS21	760	0	0	0	0	0	0	0
TS22	763	234	213	46	0	0	443	493
TS3	766	177	42	5	2	0	219	226
TS4	769	129	13	19	1	0	142	162
TS5	772	87	57	39	0	0	144	183
TS6	775	268	55	56	0	0	323	379
TS7	778	4	2	0	0	0	6	6
TS9	781	219	61	24	0	0	280	304

Table 7 (continued)
Morganza to the Gulf Economic Update
Number of Structures by Reach and Category

Reach Name	Station Number	Residential	Mobile Homes	Commercial	Industrial	Interviewed Industrial	Vehicles	Structure Total
US1	784	0	0	2	0	0	0	2
E1-B	790	0	0	0	0	0	0	0
BB7-B	793	0	0	0	0	0	0	0
BD1-B	796	1	0	0	0	0	1	1
BC	799	0	0	0	0	0	0	0
L2L-A	802	308	76	33	9	0	384	426
L2L-B	805	278	244	57	8	0	672	587
Total		48,209	12,607	7,286	177	24	70,846	68,303

Table 11
Morganza to the Gulf Economic Update
Depth-Damage Relationships for Structures, Contents, Vehicles, and Debris Removal

Residential			
1-Story on Pier (1STY-PIER)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.1	0.0	0.0	0.0
-1.0	1.1	1.0	1.7
-0.5	12.2	11.0	18.3
0.0	15.2	13.7	22.8
0.5	49.4	44.4	74.0
1.0	50.1	45.1	75.1
1.5	66.7	60.0	100.0
2.0	70.2	63.2	100.0
3.0	71.2	64.1	100.0
4.0	97.5	87.7	100.0
5.0	97.5	87.7	100.0
6.0	97.5	87.7	100.0
7.0	97.5	87.7	100.0
8.0	97.5	87.7	100.0
9.0	97.5	87.7	100.0
10.0	97.5	87.7	100.0
11.0	97.5	87.7	100.0
12.0	97.5	87.7	100.0
13.0	97.5	87.7	100.0
14.0	97.5	87.7	100.0
15.0	97.5	87.7	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	95.0	90.0	98.0
1.0	95.0	90.0	98.0
1.5	95.0	90.0	98.0
2.0	95.0	95.0	98.0
3.0	95.0	95.0	98.0
4.0	98.0	98.0	100.0
5.0	98.0	98.0	100.0
6.0	98.0	98.0	100.0
7.0	98.0	98.0	100.0
8.0	98.0	98.0	100.0
9.0	98.0	98.0	100.0
10.0	98.0	98.0	100.0
11.0	98.0	98.0	100.0
12.0	98.0	98.0	100.0
13.0	98.0	98.0	100.0
14.0	98.0	98.0	100.0
15.0	98.0	98.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	85.0	15.0
5.0	92.0	14.0
12.0	100.0	15.0

Residential			
1-Story on Slab (1STY-SLAB)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	1.1	1.0	1.7
0.0	1.1	1.0	1.7
0.5	23.3	21.0	35.0
1.0	23.3	21.0	35.0
1.5	37.2	35.5	55.9
2.0	41.9	37.7	62.9
3.0	45.3	40.8	68.0
4.0	92.0	82.8	100.0
5.0	92.0	82.8	100.0
6.0	92.0	82.8	100.0
7.0	92.0	82.8	100.0
8.0	92.0	82.8	100.0
9.0	92.0	82.8	100.0
10.0	92.0	82.8	100.0
11.0	92.0	82.8	100.0
12.0	92.0	82.8	100.0
13.0	92.0	82.8	100.0
14.0	92.0	82.8	100.0
15.0	92.0	82.8	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	95.0	90.0	98.0
1.0	95.0	90.0	98.0
1.5	95.0	90.0	98.0
2.0	95.0	95.0	98.0
3.0	95.0	95.0	98.0
4.0	98.0	98.0	100.0
5.0	98.0	98.0	100.0
6.0	98.0	98.0	100.0
7.0	98.0	98.0	100.0
8.0	98.0	98.0	100.0
9.0	98.0	98.0	100.0
10.0	98.0	98.0	100.0
11.0	98.0	98.0	100.0
12.0	98.0	98.0	100.0
13.0	98.0	98.0	100.0
14.0	98.0	98.0	100.0
15.0	98.0	98.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	87.0	14.0
5.0	94.0	15.0
12.0	100.0	15.0

Residential			
2-Story on Pier (2STY-PIER)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.1	0.0	0.0	0.0
-1.0	1.4	1.2	2.1
-0.5	2.2	2.0	3.3
0.0	6.4	5.8	9.6
0.5	19.0	17.1	28.5
1.0	19.0	17.1	28.5
1.5	31.9	28.7	47.9
2.0	32.6	29.3	48.9
3.0	33.3	30.0	49.9
4.0	93.4	84.0	100.0
5.0	93.4	84.0	100.0
6.0	93.4	84.0	100.0
7.0	93.4	84.0	100.0
8.0	93.4	84.0	100.0
9.0	93.6	84.2	100.0
10.0	93.6	84.2	100.0
11.0	93.6	84.2	100.0
12.0	96.6	86.9	100.0
13.0	96.6	86.9	100.0
14.0	96.6	86.9	100.0
15.0	96.6	86.9	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	69.6	66.2	73.1
1.0	69.6	66.2	73.1
1.5	74.7	70.9	78.4
2.0	74.7	70.9	78.4
3.0	78.5	74.6	82.5
4.0	79.9	75.9	83.9
5.0	83.2	79.0	87.3
6.0	83.2	79.0	87.3
7.0	83.2	79.0	87.3
8.0	83.2	79.0	87.3
9.0	83.2	79.0	87.3
10.0	83.2	79.0	87.3
11.0	97.5	92.6	100.0
12.0	97.8	92.9	100.0
13.0	98.5	93.6	100.0
14.0	98.5	93.6	100.0
15.0	98.5	93.6	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	85.0	14.0
5.0	92.0	14.0
12.0	100.0	15.0

Table 11 (continued)
Morganza to the Gulf Economic Update
Depth-Damage Relationships for Structures, Contents, Vehicles, and Debris Removal

Residential
2-Story on Slab (2STY-SLAB)

Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	1.2	1.1	1.8
0.0	1.2	1.1	1.8
0.5	16.1	14.5	24.2
1.0	16.1	14.5	24.2
1.5	26.1	23.5	39.1
2.0	27.1	24.4	40.7
3.0	28.5	25.7	42.8
4.0	80.0	72.0	100.0
5.0	80.0	72.0	100.0
6.0	80.0	72.0	100.0
7.0	80.0	72.0	100.0
8.0	80.0	72.0	100.0
9.0	80.0	72.0	100.0
10.0	80.3	72.3	100.0
11.0	80.3	72.3	100.0
12.0	80.3	72.3	100.0
13.0	83.2	74.9	100.0
14.0	83.2	74.9	100.0
15.0	83.2	74.9	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	69.6	66.2	73.1
1.0	69.6	66.2	73.1
1.5	74.7	70.9	78.4
2.0	74.7	70.9	78.4
3.0	78.5	74.6	82.5
4.0	79.9	75.9	83.9
5.0	83.2	79.0	87.3
6.0	83.2	79.0	87.3
7.0	83.2	79.0	87.3
8.0	83.2	79.0	87.3
9.0	83.2	79.0	87.3
10.0	83.2	79.0	87.3
11.0	97.5	92.6	100.0
12.0	97.8	92.9	100.0
13.0	98.5	93.6	100.0
14.0	98.5	93.6	100.0
15.0	98.5	93.6	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	82.0	11.0
5.0	90.0	12.0
12.0	100.0	12.0

Mobile Home
Mobile Home (MOBHOM)

Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.1	0.0	0.0	0.0
-1.0	6.4	6.1	8.6
-0.5	7.3	6.9	9.8
0.0	9.9	9.4	13.4
0.5	43.4	41.2	58.6
1.0	44.7	42.5	60.3
2.0	97.6	92.7	100.0
3.0	97.6	92.7	100.0
4.0	97.6	92.7	100.0
5.0	97.6	92.7	100.0
6.0	97.6	92.7	100.0
7.0	97.6	92.7	100.0
8.0	97.6	92.7	100.0
9.0	97.6	92.7	100.0
10.0	97.6	92.7	100.0
11.0	97.6	92.7	100.0
12.0	97.6	92.7	100.0
13.0	97.6	92.7	100.0
14.0	97.6	92.7	100.0
15.0	97.6	92.7	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	95.0	90.0	100.0
1.0	96.0	92.0	100.0
1.5	97.0	94.0	100.0
2.0	98.0	96.0	100.0
3.0	99.0	98.0	100.0
4.0	100.0	100.0	100.0
5.0	100.0	100.0	100.0
6.0	100.0	100.0	100.0
7.0	100.0	100.0	100.0
8.0	100.0	100.0	100.0
9.0	100.0	100.0	100.0
10.0	100.0	100.0	100.0
11.0	100.0	100.0	100.0
12.0	100.0	100.0	100.0
13.0	100.0	100.0	100.0
14.0	100.0	100.0	100.0
15.0	100.0	100.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	82.0	14.0
5.0	90.0	14.0
12.0	100.0	15.0

Commercial
Multi-Family Residence (MULTI)

Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	6.6	6.2	7.6
0.5	19.8	18.4	22.8
1.0	19.8	18.4	22.8
1.5	24.5	22.8	28.2
2.0	24.5	22.8	29.5
3.0	29.6	26.6	37.0
4.0	34.7	31.2	43.4
5.0	37.9	34.1	47.4
6.0	37.9	34.1	47.4
7.0	37.9	34.1	47.4
8.0	63.3	57.0	79.2
9.0	63.3	57.0	79.2
10.0	63.3	57.0	79.2
11.0	63.3	57.0	79.2
12.0	63.3	57.0	79.2
13.0	63.3	57.0	79.2
14.0	63.3	57.0	79.2
15.0	63.3	57.0	79.2

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	20.1	15.8	22.2
1.0	26.2	22.4	28.7
1.5	33.5	31.2	35.2
2.0	42.4	40.5	46.2
3.0	49.8	46.6	51.4
4.0	51.7	50.3	53.0
5.0	51.7	50.3	53.1
6.0	51.7	50.3	54.6
7.0	51.7	50.3	54.6
8.0	51.7	50.3	54.6
9.0	51.7	50.3	54.6
10.0	71.8	56.4	79.3
11.0	85.2	79.6	89.5
12.0	100.0	93.5	100.0
13.0	100.0	97.1	100.0
14.0	100.0	97.1	100.0
15.0	100.0	97.1	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	77.0	7.0
5.0	83.0	7.0
12.0	100.0	10.0

Table 11 (continued)
Morganza to the Gulf Economic Update
Depth-Damage Relationships for Structures, Contents, Vehicles, and Debris Removal

Commercial			
Warehouses & Contractors (WARE)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	1.1	1.1	1.3
0.5	22.3	20.8	25.7
1.0	23.7	22.1	27.3
1.5	25.8	24.0	29.7
2.0	32.7	29.5	39.3
3.0	34.4	31.0	43.0
4.0	79.1	71.2	100.0
5.0	79.1	71.2	100.0
6.0	79.1	71.2	100.0
7.0	79.1	71.2	100.0
8.0	79.1	71.2	100.0
9.0	79.1	71.2	100.0
10.0	79.1	71.2	100.0
11.0	79.1	71.2	100.0
12.0	80.5	72.4	100.0
13.0	80.5	72.4	100.0
14.0	80.5	72.4	100.0
15.0	80.5	72.4	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	17.6	16.8	22.0
1.0	22.1	21.0	27.7
1.5	22.1	21.0	27.7
2.0	29.2	27.8	36.6
3.0	34.0	32.3	42.5
4.0	42.8	40.7	53.6
5.0	50.8	48.3	63.5
6.0	58.7	55.8	73.4
7.0	66.7	63.4	83.4
8.0	74.6	70.9	93.3
9.0	79.7	75.7	99.6
10.0	79.7	75.7	99.6
11.0	79.7	75.7	99.6
12.0	79.7	75.7	99.6
13.0	79.7	75.7	99.6
14.0	79.7	75.7	99.6
15.0	79.7	75.7	99.6

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	76.0	13.0
5.0	87.0	14.0
12.0	100.0	14.0

Commercial			
Grocery (GROC)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	6.6	6.2	7.6
0.5	19.8	18.4	22.8
1.0	19.8	18.4	22.8
1.5	24.5	22.8	28.2
2.0	24.5	22.8	29.5
3.0	29.6	26.6	37.0
4.0	34.7	31.2	43.4
5.0	37.9	34.1	47.4
6.0	37.9	34.1	47.4
7.0	37.9	34.1	47.4
8.0	63.3	57.0	79.2
9.0	63.3	57.0	79.2
10.0	63.3	57.0	79.2
11.0	63.3	57.0	79.2
12.0	63.3	57.0	79.2
13.0	63.3	57.0	79.2
14.0	63.3	57.0	79.2
15.0	63.3	57.0	79.2

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	99.1	94.1	100.0
1.0	100.0	95.0	100.0
1.5	100.0	95.0	100.0
2.0	100.0	95.0	100.0
3.0	100.0	95.0	100.0
4.0	100.0	95.0	100.0
5.0	100.0	95.0	100.0
6.0	100.0	95.0	100.0
7.0	100.0	95.0	100.0
8.0	100.0	95.0	100.0
9.0	100.0	95.0	100.0
10.0	100.0	95.0	100.0
11.0	100.0	95.0	100.0
12.0	100.0	95.0	100.0
13.0	100.0	95.0	100.0
14.0	100.0	95.0	100.0
15.0	100.0	95.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	95.0	21.0
5.0	97.0	21.0
12.0	100.0	21.0

Commercial			
Professional Services (PROF)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	6.6	6.2	7.6
0.5	19.8	18.4	22.8
1.0	19.8	18.4	22.8
1.5	24.5	22.8	28.2
2.0	24.5	22.8	29.5
3.0	29.6	26.6	37.0
4.0	34.7	31.2	43.4
5.0	37.9	34.1	47.4
6.0	37.9	34.1	47.4
7.0	37.9	34.1	47.4
8.0	63.3	57.0	79.2
9.0	63.3	57.0	79.2
10.0	63.3	57.0	79.2
11.0	63.3	57.0	79.2
12.0	63.3	57.0	79.2
13.0	63.3	57.0	79.2
14.0	63.3	57.0	79.2
15.0	63.3	57.0	79.2

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	35.0	30.0	50.0
1.0	43.3	37.1	61.8
1.5	56.7	48.6	81.0
2.0	63.9	54.8	91.3
3.0	100.0	85.7	100.0
4.0	100.0	100.0	100.0
5.0	100.0	100.0	100.0
6.0	100.0	100.0	100.0
7.0	100.0	100.0	100.0
8.0	100.0	100.0	100.0
9.0	100.0	100.0	100.0
10.0	100.0	100.0	100.0
11.0	100.0	100.0	100.0
12.0	100.0	100.0	100.0
13.0	100.0	100.0	100.0
14.0	100.0	100.0	100.0
15.0	100.0	100.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	95.0	22.0
5.0	96.0	22.0
12.0	100.0	22.0

Table 11 (continued)
Morganza to the Gulf Economic Update
Depth-Damage Relationships for Structures, Contents, Vehicles, and Debris Removal

Commercial Repairs & Home Use (REPA)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	1.1	1.1	1.3
0.5	22.3	20.8	25.7
1.0	23.7	22.1	27.3
1.5	25.8	24.0	29.7
2.0	32.7	29.5	39.3
3.0	34.4	31.0	43.0
4.0	79.1	71.2	100.0
5.0	79.1	71.2	100.0
6.0	79.1	71.2	100.0
7.0	79.1	71.2	100.0
8.0	79.1	71.2	100.0
9.0	79.1	71.2	100.0
10.0	79.1	71.2	100.0
11.0	79.1	71.2	100.0
12.0	80.5	72.4	100.0
13.0	80.5	72.4	100.0
14.0	80.5	72.4	100.0
15.0	80.5	72.4	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	33.3	31.7	41.7
1.0	34.3	32.6	42.9
1.5	34.3	32.6	42.9
2.0	69.2	65.7	86.5
3.0	70.6	67.1	88.3
4.0	72.1	68.5	90.2
5.0	80.6	76.6	100.0
6.0	83.7	79.6	100.0
7.0	83.7	79.6	100.0
8.0	83.7	79.6	100.0
9.0	83.7	79.6	100.0
10.0	83.7	79.6	100.0
11.0	83.7	79.6	100.0
12.0	83.7	79.6	100.0
13.0	83.7	79.6	100.0
14.0	83.7	79.6	100.0
15.0	83.7	79.6	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	95.0	21.0
5.0	97.0	21.0
12.0	100.0	21.0

Commercial Retail and Personal Services (RETA)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	1.1	1.1	1.3
0.5	22.3	20.8	25.7
1.0	23.7	22.1	27.3
1.5	25.8	24.0	29.7
2.0	32.7	29.5	39.3
3.0	34.4	31.0	43.0
4.0	79.1	71.2	100.0
5.0	79.1	71.2	100.0
6.0	79.1	71.2	100.0
7.0	79.1	71.2	100.0
8.0	79.1	71.2	100.0
9.0	79.1	71.2	100.0
10.0	79.1	71.2	100.0
11.0	79.1	71.2	100.0
12.0	80.5	72.4	100.0
13.0	80.5	72.4	100.0
14.0	80.5	72.4	100.0
15.0	80.5	72.4	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	36.6	34.8	45.7
1.0	60.5	57.5	75.7
1.5	60.5	57.5	75.7
2.0	75.4	71.6	94.2
3.0	85.1	80.8	100.0
4.0	94.5	89.7	100.0
5.0	100.0	95.0	100.0
6.0	100.0	95.0	100.0
7.0	100.0	95.0	100.0
8.0	100.0	95.0	100.0
9.0	100.0	95.0	100.0
10.0	100.0	95.0	100.0
11.0	100.0	95.0	100.0
12.0	100.0	95.0	100.0
13.0	100.0	95.0	100.0
14.0	100.0	95.0	100.0
15.0	100.0	95.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	95.0	22.0
5.0	96.0	22.0
12.0	100.0	22.0

Commercial Eating & Recreation (EAT)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	6.6	6.2	7.6
0.5	19.8	18.4	22.8
1.0	19.8	18.4	22.8
1.5	24.5	22.8	28.2
2.0	24.5	22.8	29.5
3.0	29.6	26.6	37.0
4.0	34.7	31.2	43.4
5.0	37.9	34.1	47.4
6.0	37.9	34.1	47.4
7.0	37.9	34.1	47.4
8.0	63.3	57.0	79.2
9.0	63.3	57.0	79.2
10.0	63.3	57.0	79.2
11.0	63.3	57.0	79.2
12.0	63.3	57.0	79.2
13.0	63.3	57.0	79.2
14.0	63.3	57.0	79.2
15.0	63.3	57.0	79.2

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	41.2	39.2	51.5
1.0	45.6	43.3	57.0
1.5	73.3	69.6	91.6
2.0	74.8	71.1	93.5
3.0	92.4	87.8	100.0
4.0	100.0	95.0	100.0
5.0	100.0	95.0	100.0
6.0	100.0	95.0	100.0
7.0	100.0	95.0	100.0
8.0	100.0	95.0	100.0
9.0	100.0	95.0	100.0
10.0	100.0	95.0	100.0
11.0	100.0	95.0	100.0
12.0	100.0	95.0	100.0
13.0	100.0	95.0	100.0
14.0	100.0	95.0	100.0
15.0	100.0	95.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	96.0	22.0
5.0	98.0	22.0
12.0	100.0	22.0

Table 11 (continued)
Morganza to the Gulf Economic Update
Depth-Damage Relationships for Structures, Contents, Vehicles, and Debris Removal

Commercial			
Public Facilities (PUBL)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	1.1	1.1	1.3
0.5	22.3	20.8	25.7
1.0	23.7	22.1	27.3
1.5	25.8	24.0	29.7
2.0	32.7	29.5	39.3
3.0	34.4	31.0	43.0
4.0	79.1	71.2	100.0
5.0	79.1	71.2	100.0
6.0	79.1	71.2	100.0
7.0	79.1	71.2	100.0
8.0	79.1	71.2	100.0
9.0	79.1	71.2	100.0
10.0	79.1	71.2	100.0
11.0	79.1	71.2	100.0
12.0	80.5	72.4	100.0
13.0	80.5	72.4	100.0
14.0	80.5	72.4	100.0
15.0	80.5	72.4	100.0

Depth in Structure	Contents Percent Damage	Contents Lower Percent	Contents Higher Percent
-1.0	0.0	0.0	0.0
-0.5	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.5	80.0	60.0	88.0
1.0	85.0	63.8	93.5
1.5	85.7	64.3	94.2
2.0	86.6	65.0	95.3
3.0	100.0	75.0	100.0
4.0	100.0	75.0	100.0
5.0	100.0	75.0	100.0
6.0	100.0	75.0	100.0
7.0	100.0	75.0	100.0
8.0	100.0	75.0	100.0
9.0	100.0	75.0	100.0
10.0	100.0	75.0	100.0
11.0	100.0	75.0	100.0
12.0	100.0	75.0	100.0
13.0	100.0	75.0	100.0
14.0	100.0	75.0	100.0
15.0	100.0	75.0	100.0

Debris Depth	Debris Percent Damage	Debris Standard Deviation
0.0	0.0	0.0
2.0	95.0	22.0
5.0	96.0	22.0
12.0	100.0	22.0

Autos			
Vehicles (AUTO)			
Depth in Structure	Structure Percent Damage	Structure Lower Percent	Structure Higher Percent
0.0	0.0	0.0	0.0
0.5	0.0	0.0	0.0
1.0	3.6	0.0	8.0
1.5	13.3	7.0	19.0
2.0	45.6	10.0	100.0
3.0	100.0	100.0	100.0
4.0	100.0	100.0	100.0
5.0	100.0	100.0	100.0
6.0	100.0	100.0	100.0
7.0	100.0	100.0	100.0
8.0	100.0	100.0	100.0
9.0	100.0	100.0	100.0
10.0	100.0	100.0	100.0
11.0	100.0	100.0	100.0
12.0	100.0	100.0	100.0
13.0	100.0	100.0	100.0
14.0	100.0	100.0	100.0
15.0	100.0	100.0	100.0
16.0	100.0	100.0	100.0
17.0	100.0	100.0	100.0

Table 11 (continued)
Morganza to the Gulf Economic Update
Depth-Damage Relationships for Transportation Infrastructure

Streets		
STREET		
Street Depth	Street Percent Damage	Street Standard Deviation
1.9	0.0	0.0
2.0	54.2	9.1
5.0	66.2	11.0
12.0	100.0	15.4

Highways		
HWY		
Highway Depth	Highway Percent Damage	Highway Standard Deviation
1.9	0.0	0.0
2.0	32.7	3.6
5.0	72.3	7.1
12.0	100.0	9.9

Railroads		
RAIL		
Railroad Depth	Railroad Percent Damage	Railroad Standard Deviation
1.9	0.0	0.0
2.0	90.6	37.8
5.0	93.9	37.9
12.0	100.0	38.1

Table 17
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	2035			2085		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
1-1AB	1	$12,659	$3,056	$9,603	$61,813	$5,258	$56,555
1-1AN	4	$14,111	$2,066	$12,045	$73,894	$4,182	$69,713
11BE1	7	$549	$152	$397	$3,272	$558	$2,714
11BE2	10	$1,248	$304	$944	$8,675	$815	$7,861
11BE3	13	$2,452	$515	$1,937	$17,832	$1,276	$16,556
11BE4	16	$1,337	$411	$926	$8,345	$988	$7,357
11BE5	19	$1,039	$304	$735	$7,278	$667	$6,611
11BE6-E	22	$28	$2	$26	$106	$4	$102
11BE6-W	25	$864	$219	$644	$4,041	$489	$3,552
1-1BU3-U1	28	$189	$85	$104	$2,332	$561	$1,771
1-1BU3-U2	31	$163	$42	$121	$1,540	$308	$1,232
1-1BU3-U3	34	$16	$3	$12	$210	$77	$133
11BU4	37	$233	$37	$196	$1,053	$477	$575
11BW11	40	$3,179	$352	$2,828	$30,991	$543	$30,449
11BW2-W1	43	$135	$43	$92	$694	$162	$532
11BW2-W2	46	$978	$317	$661	$5,224	$1,135	$4,089
11BW4-W3	49	$18	$5	$13	$95	$24	$71
11BW4-W4	52	$2,744	$808	$1,936	$18,752	$1,515	$17,236
11BW4-W4A	55	$2,964	$491	$2,474	$26,414	$741	$25,673
11BW5	58	$10,296	$2,677	$7,619	$73,000	$4,500	$68,500
11BW6	61	$5,500	$1,577	$3,923	$37,552	$2,658	$34,894
11BW79	64	$11,909	$1,825	$10,084	$52,699	$3,003	$49,696
11BW79-W7	67	$4,854	$1,363	$3,491	$32,644	$2,569	$30,075
1-2MID	70	$2,519	$666	$1,854	$10,563	$884	$9,679
1-2N	73	$4,349	$1,347	$3,002	$17,319	$1,582	$15,737
1-2S	76	$1,030	$160	$870	$4,852	$191	$4,661
1-3	79	$8,027	$1,869	$6,159	$33,244	$2,213	$31,031
1-5	82	$40,245	$7,377	$32,868	$180,953	$7,052	$173,901
1-7_N3-4	85	$126	$23	$102	$582	$27	$556
1-7_N4-7	88	$181	$45	$136	$854	$53	$801
1-7_N7-10	91	$247	$71	$176	$1,152	$90	$1,062
1-7-N10-13	94	$383	$120	$263	$1,781	$169	$1,612
1-7N13-16	97	$760	$217	$543	$3,559	$300	$3,259
1-7N16-17	100	$21	$7	$14	$97	$14	$83
1-7N17-24	103	$1,213	$336	$877	$5,635	$467	$5,168
1-7N24-28	106	$1,171	$350	$821	$5,508	$459	$5,049
1-8	109	$7,134	$2,102	$5,032	$34,499	$3,497	$31,002
2-1A2	112	$1	$0	$1	$10	$3	$7

Table 17 (continued)
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	2035			2085		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
2-1B2-MID	115	$7	$1	$5	$71	$13	$58
2-1B2N	118	$244	$79	$166	$2,416	$255	$2,161
2-1B2S	121	$14,210	$4,339	$9,871	$144,012	$9,148	$134,864
3-1B	124	$1,664	$427	$1,237	$6,370	$487	$5,883
3-1C	127	$1,442	$93	$1,349	$3,310	$105	$3,206
4-1N	130	$3,088	$312	$2,775	$8,899	$296	$8,603
4-1S	133	$6,167	$310	$5,857	$10,233	$289	$9,944
4-2	136	$8,414	$874	$7,539	$39,025	$676	$38,350
4-2A	139	$5,813	$582	$5,231	$25,122	$449	$24,674
4-2B	142	$2,423	$239	$2,184	$16,049	$186	$15,863
4-2C	145	$1,410	$137	$1,273	$9,925	$115	$9,809
4-7	148	$3,220	$603	$2,616	$14,544	$575	$13,969
4MGT	151	$1,580	$249	$1,331	$8,094	$243	$7,851
5-1A	154	$11,477	$1,050	$10,427	$47,612	$984	$46,628
5-1B	157	$10,149	$1,064	$9,085	$50,265	$976	$49,289
6-1B1	160	$56	$16	$41	$549	$23	$526
6-1B1-B	163	$21	$5	$16	$204	$14	$190
8-1N	166	$387	$29	$359	$1,794	$27	$1,767
8-1N-B	169	$428	$69	$359	$1,864	$105	$1,759
8-1S-B	175	$1,642	$255	$1,387	$7,331	$373	$6,958
8-2C	178	$104	$28	$76	$541	$36	$505
8-2D	181	$1,924	$113	$1,810	$4,454	$126	$4,328
9-1AE	184	$104	$36	$68	$1,018	$177	$841
9-1AMID	187	$11	$4	$7	$104	$18	$87
9-1AW	190	$34	$12	$21	$326	$57	$269
9-1BE	193	$171	$48	$122	$1,687	$342	$1,345
9-1BMIDE	196	$1,308	$598	$710	$12,244	$1,543	$10,700
9-1BMIDW	199	$450	$206	$244	$4,210	$483	$3,728
9-1BW	202	$1,684	$708	$976	$16,072	$2,345	$13,727
A1	205	$3,067	$323	$2,744	$24,995	$499	$24,496
B1	208	$136	$28	$108	$1,546	$51	$1,495
BB1	211	$365	$189	$176	$1,910	$342	$1,568
BB2	214	$97	$41	$56	$459	$100	$359
BB3	217	$409	$137	$272	$4,144	$464	$3,680
BB4	220	$3	$0	$3	$35	$13	$22
BB5	223	$1,189	$461	$728	$11,354	$1,319	$10,036
BB6	226	$214	$19	$195	$1,211	$35	$1,177
BB7	229	$1,262	$263	$999	$13,480	$425	$13,055
BB8-B	235	$2,123	$55	$2,067	$9,493	$249	$9,244

Table 17 (continued)
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	2035			2085		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
BD1	238	$615	$137	$478	$3,442	$194	$3,248
BDL0	241	$127	$32	$95	$702	$36	$666
BDL1	244	$85	$24	$62	$473	$33	$440
BDL2	247	$52	$5	$48	$222	$7	$215
BDL3	250	$1,881	$137	$1,744	$4,875	$167	$4,708
BDL4	253	$720	$41	$678	$1,973	$79	$1,894
BDL4-B	256	$1,179	$382	$797	$3,828	$703	$3,125
BDL5	259	$2,691	$122	$2,570	$9,117	$144	$8,973
BGC0	262	$906	$107	$799	$4,815	$122	$4,693
BGC1	265	$332	$25	$308	$1,290	$30	$1,260
BGC2	268	$784	$50	$734	$2,918	$57	$2,861
BGC3	271	$5,473	$245	$5,228	$13,035	$287	$12,748
BGC4	274	$5,434	$256	$5,177	$13,333	$297	$13,036
BL1	277	$771	$28	$743	$2,352	$35	$2,317
BL2	280	$2,354	$689	$1,665	$28,295	$711	$27,584
BL3	283	$973	$309	$664	$11,598	$323	$11,275
BL4	286	$1,224	$235	$989	$18,489	$244	$18,245
BL5	289	$945	$335	$610	$12,926	$1,173	$11,753
BL6	292	$3,460	$1,501	$1,959	$49,672	$2,486	$47,187
BL7	295	$9,461	$3,105	$6,357	$74,829	$5,367	$69,461
BL89	298	$22,182	$4,945	$17,237	$150,755	$6,110	$144,645
BPC1	301	$4,840	$1,174	$3,666	$20,365	$1,082	$19,283
BPC2	304	$1,335	$94	$1,241	$6,825	$90	$6,734
BPC3	307	$2,337	$261	$2,077	$14,073	$243	$13,829
BPC4	310	$1,462	$139	$1,323	$10,913	$132	$10,781
BPC5	313	$3,917	$157	$3,761	$10,444	$214	$10,230
BPC5-B	316	$2,843	$229	$2,613	$7,932	$343	$7,589
BT1	319	$11,772	$1,761	$10,011	$56,498	$1,405	$55,093
BT10	322	$34	$3	$32	$161	$93	$68
BT2	325	$1,604	$269	$1,335	$5,783	$212	$5,571
BT3	328	$588	$38	$550	$2,588	$35	$2,553
BT4	331	$2,327	$224	$2,104	$11,913	$173	$11,740
BT4-SA	334	$1,700	$103	$1,598	$2,900	$95	$2,805
BT5	337	$369	$22	$348	$1,785	$17	$1,768
BT5-B	340	$170	$163	$7	$906	$269	$637
BT6	343	$5,024	$1,794	$3,230	$23,323	$3,679	$19,644
BT6A	346	$3,015	$956	$2,058	$14,432	$1,986	$12,446
BT7	349	$728	$281	$447	$3,442	$783	$2,658
BT8	352	$320	$115	$204	$1,479	$598	$881

Table 17 (continued)
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	2035			2085		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
BT9	355	$304	$53	$251	$1,405	$762	$642
C1	358	$339	$77	$262	$3,989	$134	$3,855
C1-LF	361	$28	$11	$17	$268	$27	$241
CC1	364	$994	$173	$822	$5,388	$200	$5,187
D-01	367	$157	$25	$132	$370	$23	$347
D-06	370	$225	$16	$209	$701	$21	$680
D10	373	$652	$54	$598	$1,435	$62	$1,373
D-16N	376	$210	$40	$170	$2,300	$59	$2,241
D-16S	379	$599	$129	$470	$7,757	$173	$7,584
D-1732	382	$901	$164	$737	$9,338	$234	$9,103
D1A	385	$25	$5	$20	$266	$9	$257
D1B	388	$7	$1	$6	$94	$2	$92
D1b-LF	391	$32	$10	$22	$340	$18	$323
D1C	394	$282	$42	$241	$2,985	$63	$2,922
D1c-LF1	397	$755	$214	$541	$7,670	$349	$7,321
D1c-LF2	400	$635	$213	$422	$6,246	$421	$5,825
D1c-LF3	403	$29	$11	$18	$286	$24	$262
D-25	406	$2,048	$388	$1,660	$11,879	$380	$11,500
D-25-B	409	$1	$7	($6)	$7	$9	($2)
D-26	412	$880	$103	$777	$4,925	$139	$4,786
D-28	415	$1,108	$265	$843	$11,169	$669	$10,500
D-29	418	$6,082	$2,290	$3,792	$56,852	$4,297	$52,555
D-30	421	$178	$36	$142	$2,358	$48	$2,310
D-31	424	$43	$13	$30	$453	$25	$428
D-34N	427	$315	$55	$259	$3,658	$75	$3,584
D-34S	430	$165	$18	$146	$1,552	$25	$1,527
D-35	433	$102	$12	$91	$937	$16	$921
D-36	436	$1,283	$243	$1,040	$4,727	$189	$4,538
D-37	439	$355	$48	$307	$2,172	$37	$2,135
D-38	442	$3,602	$473	$3,128	$16,997	$680	$16,317
D-39-1	445	$1,504	$359	$1,145	$7,546	$575	$6,971
D-39-2	448	$643	$161	$482	$3,162	$276	$2,886
D-39-3	451	$1,761	$446	$1,314	$8,726	$768	$7,958
D-42	454	$285	$52	$233	$2,796	$76	$2,719
D-43	457	$3,018	$282	$2,736	$14,477	$265	$14,212
D-44	460	$224	$39	$186	$2,338	$55	$2,284
D-45	463	$37	$5	$32	$431	$6	$425
D-48	466	$35	$6	$29	$488	$8	$480
D-49	469	$6	$1	$4	$61	$1	$60

Table 17 (continued)
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	2035			2085		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
D-50	472	$1,079	$47	$1,032	$5,296	$62	$5,234
D-51	475	$410	$50	$359	$3,178	$73	$3,105
D-53	478	$3,053	$437	$2,616	$15,515	$610	$14,905
D-56	481	$794	$82	$712	$5,646	$65	$5,581
D-60	484	$1,631	$159	$1,472	$8,863	$148	$8,715
D-61	487	$432	$37	$394	$982	$37	$945
D-61-B	490	$16	$17	($2)	$35	$30	$5
D-62-B	496	$79	$6	$73	$404	$10	$394
D-64	499	$1,221	$211	$1,010	$5,970	$290	$5,680
E1	502	$451	$37	$414	$2,103	$57	$2,046
E1-LF	505	$1	$0	$1	$10	$1	$10
E1-LF-B	508	$359	$27	$331	$4,192	$91	$4,101
E2	511	$35	$2	$33	$173	$2	$171
E2-B	514	$124	$12	$112	$541	$41	$500
E2-LF	517	$5,000	$647	$4,354	$31,467	$870	$30,597
E2-LF-B	520	$0	$0	$0	$0	$0	$0
FC	523	$88	$8	$81	$187	$7	$180
GW10	526	$7,386	$1,714	$5,671	$40,891	$2,424	$38,467
GW11	529	$586	$154	$432	$3,104	$241	$2,863
GW12	532	$3,630	$1,677	$1,953	$17,101	$2,761	$14,339
GW13	535	$4,021	$920	$3,101	$18,887	$1,082	$17,804
GW14	538	$8,330	$2,552	$5,778	$45,371	$2,876	$42,495
GW14-1	541	$1,082	$159	$923	$7,734	$185	$7,549
GW15	544	$1,420	$463	$957	$7,190	$664	$6,526
GW16	547	$408	$81	$327	$2,051	$127	$1,924
GW17	550	$1,624	$130	$1,493	$6,179	$126	$6,053
GW18	553	$485	$146	$340	$2,700	$210	$2,490
GW18-B	556	$1	$0	$1	$8	$0	$8
GW2	559	$428	$47	$381	$2,294	$49	$2,245
GW3	562	$1,603	$133	$1,470	$6,659	$153	$6,507
GW4	565	$77	$20	$57	$343	$25	$318
GW5	568	$38	$6	$33	$140	$7	$133
GW6	571	$53	$5	$48	$213	$5	$208
GW7	574	$45	$2	$44	$208	$2	$206
GW8	577	$14	$1	$13	$59	$1	$58
GW9	580	$3,440	$298	$3,141	$12,928	$319	$12,610
HC1	583	$999	$265	$734	$5,617	$382	$5,235
HC2	586	$114	$8	$106	$494	$12	$482
HC3	589	$1,004	$139	$865	$5,408	$157	$5,251

Table 17 (continued)
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	2035			2085		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
HC4	592	$229	$22	$208	$1,077	$26	$1,052
HNC0	595	$11,380	$942	$10,437	$51,575	$856	$50,720
HNC1	598	$1,309	$188	$1,121	$5,846	$169	$5,676
HNC10	601	$109	$10	$99	$305	$15	$290
HNC10-B	604	$2,148	$137	$2,011	$4,596	$202	$4,394
HNC2	607	$3,840	$378	$3,462	$15,322	$341	$14,981
HNC3	610	$2,299	$147	$2,152	$6,079	$149	$5,930
HNC4	613	$548	$26	$522	$1,176	$30	$1,147
HNC5	616	$871	$104	$767	$3,356	$126	$3,230
HNC6	619	$7,778	$734	$7,045	$36,714	$848	$35,867
HNC7	622	$39,634	$4,325	$35,310	$180,988	$5,091	$175,897
HNC8	625	$1,788	$107	$1,680	$4,631	$200	$4,432
HNC9	628	$39	$2	$37	$85	$2	$83
HNC9-B	631	$1,961	$142	$1,819	$3,435	$192	$3,243
HNC9-E	634	$110	$5	$105	$224	$6	$218
HNC9-W	637	$521	$28	$493	$1,127	$31	$1,096
LB1	640	$0	$0	$0	$0	$0	$0
LB2	643	$1,310	$145	$1,165	$6,597	$134	$6,463
LB3	646	$76	$2	$73	$259	$2	$257
LB4	649	$2,143	$325	$1,819	$9,316	$308	$9,009
LB5	652	$1,707	$89	$1,618	$6,146	$89	$6,057
LBB2	655	$9	$3	$6	$39	$19	$21
LBB3	658	$371	$172	$200	$1,737	$437	$1,300
LBB4	661	$663	$179	$484	$6,549	$1,381	$5,168
LBB5	664	$1,308	$515	$793	$12,414	$2,004	$10,410
LBB6	667	$182	$62	$121	$1,765	$330	$1,435
LBC1	670	$20	$2	$18	$105	$2	$103
LBC2	673	$51	$3	$48	$101	$3	$98
LF1	676	$359	$35	$324	$2,144	$44	$2,100
LF2	679	$241	$17	$225	$1,147	$25	$1,123
LF-GB	682	$1,693	$140	$1,553	$4,316	$146	$4,169
LL1	685	$131	$5	$126	$565	$5	$560
LL2	688	$0	$0	$0	$0	$0	$0
LL3	691	$16	$0	$16	$45	$0	$45
MC1	694	$34	$16	$18	$478	$22	$456
OB1	697	$213	$86	$127	$987	$333	$654
OB2	700	$115	$33	$82	$544	$163	$381
OB3	703	$674	$83	$591	$2,837	$143	$2,694
OB4	706	$1,131	$209	$922	$5,687	$308	$5,379

Table 17 (continued)
Morganza to the Gulf Economic Update
Expected Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	2035			2085		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
PAC1	709	$1,164	$159	$1,004	$3,222	$131	$3,092
SL1	712	$2,747	$229	$2,518	$8,291	$198	$8,094
SL2	715	$440	$68	$372	$1,162	$59	$1,102
SL3	718	$1,753	$274	$1,479	$5,015	$224	$4,791
TS1	721	$237	$19	$217	$3,236	$1,450	$1,786
TS10	724	$190	$99	$91	$2,382	$290	$2,093
TS11	727	$622	$200	$422	$8,162	$363	$7,799
TS12	730	$538	$99	$439	$4,799	$200	$4,598
TS13	733	$123	$23	$100	$1,109	$42	$1,067
TS14	736	$28	$9	$19	$343	$17	$326
TS15	739	$605	$323	$282	$7,558	$912	$6,646
TS16	742	$958	$465	$492	$12,434	$1,022	$11,412
TS17	745	$117	$50	$67	$1,559	$91	$1,468
TS18	748	$147	$37	$110	$1,773	$61	$1,713
TS19	751	$4,386	$902	$3,484	$26,335	$1,709	$24,626
TS2	754	$1,452	$549	$903	$16,098	$1,887	$14,211
TS20	757	$83	$11	$72	$516	$20	$495
TS21	760	$3	$2	$2	$20	$3	$18
TS22	763	$2,953	$844	$2,109	$17,671	$1,194	$16,477
TS3	766	$712	$221	$491	$7,931	$426	$7,506
TS4	769	$624	$245	$379	$7,988	$481	$7,507
TS5	772	$106	$29	$77	$1,266	$228	$1,039
TS6	775	$473	$160	$313	$5,732	$623	$5,109
TS7	778	$9	$5	$4	$112	$18	$93
TS9	781	$327	$121	$206	$4,271	$373	$3,898
US1	784	$13	$10	$3	$166	$18	$149
GW11-B	787	$0	$0	$0	$0	$0	$0
E1-B	790	$3	$7	($4)	$18	$23	($4)
BB7-B	793	$2	$8	($6)	$26	$29	($3)
BD1-B	796	$13	$0	$13	$78	$1	$77
BC	799	$5	$0	$4	$43	$0	$43
L2L-A	802	$17,080	$1,197	$15,883	$62,669	$1,354	$61,315
L2L-B	805	$5,878	$995	$4,883	$29,493	$1,587	$27,906
Total		**$551,614**	**$99,854**	**$451,760**	**$2,981,220**	**$158,142**	**$2,823,078**

Table 20
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	Federal Interest Rate of 2.25%			OMB Interest Rate of 7%		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
1-1AB	1	$32,681	$3,953	$28,728	$25,227	$3,619	$21,608
1-1AN	4	$38,463	$2,928	$35,535	$29,397	$2,607	$26,790
11BE1	7	$1,658	$317	$1,341	$1,245	$256	$989
11BE2	10	$4,273	$512	$3,762	$3,147	$434	$2,713
11BE3	13	$8,717	$825	$7,892	$6,384	$709	$5,675
11BE4	16	$4,191	$646	$3,546	$3,129	$558	$2,570
11BE5	19	$3,581	$452	$3,128	$2,634	$397	$2,237
11BE6-E	22	$60	$3	$57	$48	$3	$45
11BE6-W	25	$2,158	$329	$1,829	$1,676	$288	$1,388
1-1BU3-U1	28	$1,062	$279	$783	$737	$207	$530
1-1BU3-U2	31	$724	$150	$573	$515	$110	$405
1-1BU3-U3	34	$95	$33	$62	$65	$22	$43
11BU4	37	$567	$216	$350	$442	$150	$293
11BW11	40	$14,508	$430	$14,078	$10,291	$401	$9,890
11BW2-W1	43	$362	$91	$271	$278	$73	$204
11BW2-W2	46	$2,707	$650	$2,057	$2,064	$526	$1,538
11BW4-W3	49	$50	$13	$37	$38	$10	$28
11BW4-W4	52	$9,264	$1,096	$8,168	$6,837	$989	$5,848
11BW4-W4A	55	$12,516	$592	$11,924	$8,960	$555	$8,405
11BW5	58	$35,837	$3,420	$32,418	$26,329	$3,143	$23,185
11BW6	61	$18,556	$2,017	$16,538	$13,695	$1,853	$11,842
11BW79	64	$28,524	$2,305	$26,219	$22,338	$2,126	$20,212
11BW79-W7	67	$16,174	$1,854	$14,320	$11,960	$1,671	$10,288
1-2MID	70	$5,796	$754	$5,041	$4,576	$721	$3,854
1-2N	73	$9,632	$1,443	$8,189	$7,665	$1,407	$6,258
1-2S	76	$2,587	$173	$2,414	$2,007	$168	$1,839
1-3	79	$18,299	$2,009	$16,290	$14,475	$1,957	$12,518
1-5	82	$97,560	$7,245	$90,315	$76,222	$7,294	$68,929
1-7_N3-4	85	$312	$25	$287	$242	$24	$218
1-7_N4-7	88	$455	$48	$407	$353	$47	$306
1-7_N7-10	91	$615	$79	$537	$478	$76	$402
1-7-N10-13	94	$952	$140	$812	$740	$132	$608
1-7N13-16	97	$1,900	$251	$1,649	$1,476	$238	$1,237
1-7N16-17	100	$52	$10	$42	$40	$9	$31
1-7N17-24	103	$3,014	$389	$2,625	$2,343	$369	$1,974
1-7N24-28	106	$2,938	$395	$2,543	$2,280	$378	$1,902
1-8	109	$18,281	$2,670	$15,610	$14,131	$2,459	$11,672
2-1A2	112	$5	$1	$4	$3	$1	$3

Table 20 (continued)
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	Federal Interest Rate of 2.25%			OMB Interest Rate of 7%		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
2-1B2-MID	115	$33	$6	$27	$23	$4	$19
2-1B2N	118	$1,129	$151	$978	$800	$124	$676
2-1B2S	121	$67,082	$6,298	$60,784	$47,399	$5,569	$41,830
3-1B	124	$3,581	$452	$3,129	$2,868	$443	$2,425
3-1C	127	$2,203	$98	$2,105	$1,920	$96	$1,824
4-1N	130	$5,455	$306	$5,149	$4,574	$308	$4,265
4-1S	133	$7,823	$302	$7,522	$7,207	$305	$6,902
4-2	136	$20,883	$793	$20,089	$16,241	$823	$15,417
4-2A	139	$13,678	$528	$13,151	$10,750	$548	$10,202
4-2B	142	$7,973	$217	$7,756	$5,907	$225	$5,682
4-2C	145	$4,878	$128	$4,750	$3,587	$131	$3,456
4-7	148	$7,832	$592	$7,241	$6,115	$596	$5,519
4MGT	151	$4,234	$247	$3,987	$3,246	$247	$2,998
5-1A	154	$26,196	$1,023	$25,173	$20,716	$1,033	$19,683
5-1B	157	$26,490	$1,028	$25,462	$20,406	$1,041	$19,365
6-1B1	160	$257	$19	$238	$182	$18	$165
6-1B1-B	163	$95	$9	$87	$68	$7	$60
8-1N	166	$960	$28	$932	$747	$28	$719
8-1N-B	169	$1,013	$84	$929	$795	$78	$717
8-1S-B	175	$3,959	$303	$3,656	$3,096	$285	$2,811
8-2C	178	$282	$31	$251	$216	$30	$186
8-2D	181	$2,954	$119	$2,836	$2,571	$117	$2,454
9-1AE	184	$477	$93	$383	$338	$72	$266
9-1AMID	187	$49	$10	$39	$35	$8	$27
9-1AW	190	$153	$30	$122	$108	$24	$85
9-1BE	193	$788	$168	$620	$558	$123	$435
9-1BMIDE	196	$5,762	$983	$4,779	$4,104	$839	$3,264
9-1BMIDW	199	$1,982	$319	$1,663	$1,411	$277	$1,135
9-1BW	202	$7,545	$1,375	$6,170	$5,363	$1,127	$4,236
A1	205	$11,999	$395	$11,604	$8,674	$368	$8,306
B1	208	$711	$38	$673	$497	$34	$463
BB1	211	$994	$251	$743	$760	$228	$532
BB2	214	$245	$65	$180	$190	$56	$134
BB3	217	$1,930	$270	$1,660	$1,364	$221	$1,143
BB4	220	$16	$5	$11	$11	$3	$8
BB5	223	$5,330	$810	$4,519	$3,788	$680	$3,108
BB6	226	$620	$25	$595	$469	$23	$446
BB7	229	$6,239	$329	$5,910	$4,386	$304	$4,082
BB8-B	235	$5,125	$134	$4,991	$4,007	$105	$3,902

Table 20 (continued)
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	Federal Interest Rate of 2.25%			OMB Interest Rate of 7%		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
BD1	238	$1,767	$160	$1,606	$1,338	$152	$1,186
BDL0	241	$361	$33	$328	$274	$33	$241
BDL1	244	$243	$27	$216	$185	$26	$159
BDL2	247	$121	$6	$116	$96	$5	$90
BDL3	250	$3,101	$149	$2,951	$2,647	$145	$2,502
BDL4	253	$1,230	$57	$1,174	$1,040	$51	$989
BDL4-B	256	$2,258	$513	$1,745	$1,856	$464	$1,392
BDL5	259	$5,309	$131	$5,178	$4,334	$127	$4,207
BGC0	262	$2,498	$113	$2,385	$1,905	$111	$1,795
BGC1	265	$722	$27	$695	$577	$26	$551
BGC2	268	$1,653	$53	$1,600	$1,330	$52	$1,278
BGC3	271	$8,553	$262	$8,291	$7,406	$256	$7,151
BGC4	274	$8,651	$273	$8,378	$7,453	$267	$7,187
BL1	277	$1,415	$31	$1,384	$1,176	$30	$1,145
BL2	280	$12,921	$698	$12,222	$8,987	$695	$8,292
BL3	283	$5,301	$315	$4,986	$3,690	$313	$3,377
BL4	286	$8,256	$239	$8,018	$5,638	$237	$5,401
BL5	289	$5,825	$677	$5,149	$4,008	$550	$3,459
BL6	292	$22,283	$1,902	$20,381	$15,276	$1,753	$13,523
BL7	295	$36,087	$4,026	$32,061	$26,175	$3,683	$22,492
BL89	298	$74,554	$5,419	$69,135	$55,057	$5,243	$49,814
BPC1	301	$11,164	$1,137	$10,027	$8,810	$1,150	$7,659
BPC2	304	$3,571	$93	$3,479	$2,739	$93	$2,646
BPC3	307	$7,118	$254	$6,864	$5,338	$256	$5,082
BPC4	310	$5,312	$136	$5,176	$3,879	$137	$3,741
BPC5	313	$6,576	$180	$6,396	$5,586	$171	$5,415
BPC5-B	316	$4,916	$276	$4,640	$4,144	$258	$3,886
BT1	319	$29,990	$1,616	$28,374	$23,208	$1,670	$21,538
BT10	322	$86	$40	$46	$67	$26	$41
BT2	325	$3,306	$245	$3,061	$2,672	$254	$2,418
BT3	328	$1,403	$37	$1,366	$1,100	$38	$1,062
BT4	331	$6,232	$203	$6,029	$4,778	$211	$4,568
BT4-SA	334	$2,189	$100	$2,089	$2,007	$101	$1,906
BT5	337	$946	$20	$926	$731	$20	$711
BT5-B	340	$470	$206	$263	$358	$190	$168
BT6	343	$12,478	$2,562	$9,916	$9,703	$2,276	$7,427
BT6A	346	$7,665	$1,376	$6,289	$5,934	$1,220	$4,714
BT7	349	$1,834	$486	$1,348	$1,422	$410	$1,013
BT8	352	$792	$312	$480	$616	$239	$377

Table 20 (continued)
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	Federal Interest Rate of 2.25%			OMB Interest Rate of 7%		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
BT9	355	$753	$342	$410	$586	$235	$351
C1	358	$1,826	$101	$1,725	$1,272	$92	$1,180
C1-LF	361	$126	$18	$108	$89	$15	$74
CC1	364	$2,784	$184	$2,600	$2,117	$180	$1,938
D-01	367	$244	$24	$220	$212	$25	$187
D-06	370	$419	$18	$401	$347	$17	$330
D10	373	$971	$57	$914	$852	$56	$796
D-16N	376	$1,061	$48	$1,013	$744	$45	$699
D-16S	379	$3,515	$147	$3,368	$2,429	$140	$2,289
D-1732	382	$4,338	$193	$4,145	$3,058	$182	$2,876
D1A	385	$123	$6	$117	$86	$6	$81
D1B	388	$42	$1	$41	$29	$1	$28
D1b-LF	391	$158	$13	$145	$111	$12	$99
D1C	394	$1,383	$50	$1,333	$973	$47	$926
D1c-LF1	397	$3,572	$269	$3,303	$2,523	$249	$2,275
D1c-LF2	400	$2,921	$298	$2,623	$2,070	$266	$1,803
D1c-LF3	403	$134	$16	$117	$95	$15	$80
D-25	406	$6,053	$385	$5,668	$4,562	$386	$4,176
D-25-B	409	$4	$8	($4)	$3	$8	($5)
D-26	412	$2,528	$118	$2,410	$1,915	$112	$1,802
D-28	415	$5,206	$429	$4,777	$3,680	$368	$3,312
D-29	418	$26,762	$3,107	$23,655	$19,063	$2,803	$16,260
D-30	421	$1,066	$41	$1,025	$735	$39	$696
D-31	424	$210	$18	$192	$148	$16	$132
D-34N	427	$1,677	$63	$1,613	$1,169	$60	$1,109
D-34S	430	$730	$21	$709	$519	$20	$499
D-35	433	$442	$13	$429	$316	$13	$303
D-36	436	$2,685	$221	$2,465	$2,163	$229	$1,934
D-37	439	$1,095	$44	$1,052	$820	$45	$774
D-38	442	$9,058	$557	$8,501	$7,027	$526	$6,501
D-39-1	445	$3,965	$447	$3,518	$3,049	$414	$2,635
D-39-2	448	$1,669	$208	$1,461	$1,287	$190	$1,097
D-39-3	451	$4,598	$577	$4,020	$3,542	$529	$3,013
D-42	454	$1,307	$62	$1,246	$927	$58	$869
D-43	457	$7,686	$275	$7,410	$5,948	$278	$5,670
D-44	460	$1,085	$45	$1,040	$765	$43	$722
D-45	463	$197	$5	$192	$138	$5	$133
D-48	466	$219	$7	$212	$151	$7	$144
D-49	469	$28	$1	$27	$20	$1	$19

Table 20 (continued)
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	Federal Interest Rate of 2.25%			OMB Interest Rate of 7%		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
D-50	472	$2,797	$53	$2,744	$2,157	$51	$2,107
D-51	475	$1,537	$60	$1,478	$1,117	$56	$1,061
D-53	478	$8,129	$508	$7,621	$6,239	$482	$5,758
D-56	481	$2,771	$75	$2,695	$2,035	$78	$1,957
D-60	484	$4,577	$155	$4,422	$3,480	$156	$3,324
D-61	487	$656	$37	$619	$572	$37	$535
D-61-B	490	$23	$23	$1	$20	$21	($0)
D-62-B	496	$211	$8	$204	$162	$7	$155
D-64	499	$3,155	$243	$2,912	$2,435	$231	$2,204
E1	502	$1,124	$45	$1,079	$873	$42	$831
E1-LF	505	$5	$0	$4	$3	$0	$3
E1-LF-B	508	$1,920	$53	$1,867	$1,339	$44	$1,295
E2	511	$91	$2	$89	$70	$2	$68
E2-B	514	$294	$24	$270	$231	$20	$211
E2-LF	517	$15,781	$738	$15,043	$11,767	$704	$11,064
E2-LF-B	520	$0	$0	$0	$0	$0	$0
FC	523	$129	$7	$121	$114	$7	$106
GW10	526	$21,034	$2,003	$19,030	$15,953	$1,896	$14,057
GW11	529	$1,612	$189	$1,422	$1,230	$176	$1,054
GW12	532	$9,117	$2,118	$6,998	$7,074	$1,954	$5,120
GW13	535	$10,076	$986	$9,090	$7,822	$962	$6,861
GW14	538	$23,418	$2,684	$20,734	$17,801	$2,635	$15,166
GW14-1	541	$3,792	$170	$3,622	$2,783	$166	$2,617
GW15	544	$3,771	$545	$3,226	$2,896	$515	$2,381
GW16	547	$1,077	$100	$978	$828	$93	$735
GW17	550	$3,479	$128	$3,351	$2,788	$129	$2,659
GW18	553	$1,387	$172	$1,216	$1,051	$162	$889
GW18-B	556	$4	$0	$4	$3	$0	$3
GW2	559	$1,188	$48	$1,140	$905	$47	$858
GW3	562	$3,662	$141	$3,522	$2,896	$138	$2,758
GW4	565	$186	$22	$164	$145	$21	$124
GW5	568	$80	$6	$74	$64	$6	$58
GW6	571	$118	$5	$113	$94	$5	$89
GW7	574	$112	$2	$110	$87	$2	$85
GW8	577	$32	$1	$32	$25	$1	$25
GW9	580	$7,305	$307	$6,998	$5,866	$304	$5,562
HC1	583	$2,880	$313	$2,568	$2,180	$295	$1,885
HC2	586	$268	$9	$259	$211	$9	$202
HC3	589	$2,798	$146	$2,652	$2,130	$143	$1,987

Table 20 (continued)
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	Federal Interest Rate of 2.25%			OMB Interest Rate of 7%		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
HC4	592	$575	$23	$551	$446	$23	$423
HNC0	595	$27,752	$907	$26,845	$21,657	$920	$20,737
HNC1	598	$3,157	$180	$2,977	$2,469	$183	$2,286
HNC10	601	$189	$12	$176	$159	$12	$147
HNC10-B	604	$3,145	$163	$2,982	$2,774	$154	$2,621
HNC2	607	$8,517	$363	$8,154	$6,776	$368	$6,408
HNC3	610	$3,839	$148	$3,691	$3,265	$147	$3,118
HNC4	613	$804	$28	$776	$709	$27	$682
HNC5	616	$1,883	$113	$1,770	$1,506	$110	$1,397
HNC6	619	$19,565	$780	$18,785	$15,177	$763	$14,414
HNC7	622	$97,212	$4,637	$92,575	$75,777	$4,521	$71,256
HNC8	625	$2,946	$145	$2,801	$2,515	$131	$2,384
HNC9	628	$58	$2	$56	$51	$2	$49
HNC9-B	631	$2,561	$162	$2,399	$2,338	$155	$2,183
HNC9-E	634	$157	$6	$151	$139	$5	$134
HNC9-W	637	$768	$29	$738	$676	$29	$647
LB1	640	$0	$0	$0	$0	$0	$0
LB2	643	$3,464	$140	$3,323	$2,662	$142	$2,520
LB3	646	$150	$2	$148	$123	$2	$120
LB4	649	$5,065	$318	$4,747	$3,977	$320	$3,657
LB5	652	$3,515	$89	$3,426	$2,842	$89	$2,753
LBB2	655	$21	$9	$12	$17	$7	$10
LBB3	658	$928	$280	$648	$721	$240	$481
LBB4	661	$3,061	$668	$2,392	$2,168	$486	$1,682
LBB5	664	$5,832	$1,122	$4,710	$4,148	$896	$3,252
LBB6	667	$827	$171	$656	$587	$130	$457
LBC1	670	$55	$2	$53	$42	$2	$40
LBC2	673	$71	$3	$68	$63	$3	$60
LF1	676	$1,086	$39	$1,047	$815	$37	$778
LF2	679	$610	$20	$590	$473	$19	$454
LF-GB	682	$2,761	$142	$2,619	$2,364	$142	$2,222
LL1	685	$308	$5	$302	$242	$5	$237
LL2	688	$0	$0	$0	$0	$0	$0
LL3	691	$28	$0	$28	$24	$0	$23
MC1	694	$215	$19	$196	$148	$18	$130
OB1	697	$528	$186	$342	$411	$149	$262
OB2	700	$290	$86	$204	$224	$66	$159
OB3	703	$1,555	$108	$1,448	$1,227	$98	$1,129
OB4	706	$2,987	$249	$2,738	$2,296	$234	$2,062

Table 20 (continued)
Morganza to the Gulf Economic Update
Equivalent Annual Damages and Benefits by Reach
($ Thousands; FY22 Price Level)

Reach Name	Station Number	Federal Interest Rate of 2.25%			OMB Interest Rate of 7%		
		Without-Project Damages	With-Project Damages	Damages Reduced	Without-Project Damages	With-Project Damages	Damages Reduced
PAC1	709	$2,002	$148	$1,855	$1,690	$152	$1,538
SL1	712	$5,005	$216	$4,789	$4,164	$221	$3,943
SL2	715	$734	$65	$669	$625	$66	$559
SL3	718	$3,082	$254	$2,828	$2,587	$261	$2,326
TS1	721	$1,458	$602	$857	$1,004	$385	$619
TS10	724	$1,083	$176	$907	$750	$147	$603
TS11	727	$3,693	$266	$3,427	$2,550	$241	$2,308
TS12	730	$2,273	$140	$2,133	$1,627	$125	$1,503
TS13	733	$525	$31	$494	$376	$28	$347
TS14	736	$156	$12	$144	$108	$11	$98
TS15	739	$3,437	$563	$2,874	$2,383	$474	$1,909
TS16	742	$5,632	$692	$4,940	$3,892	$608	$3,284
TS17	745	$704	$67	$637	$486	$61	$425
TS18	748	$810	$47	$763	$563	$43	$520
TS19	751	$13,327	$1,231	$12,096	$9,998	$1,108	$8,890
TS2	754	$7,418	$1,094	$6,324	$5,197	$891	$4,306
TS20	757	$259	$15	$244	$194	$14	$180
TS21	760	$10	$2	$8	$8	$2	$6
TS22	763	$8,948	$986	$7,961	$6,716	$933	$5,783
TS3	766	$3,653	$305	$3,348	$2,558	$274	$2,284
TS4	769	$3,623	$341	$3,282	$2,507	$305	$2,201
TS5	772	$579	$110	$469	$403	$80	$323
TS6	775	$2,615	$349	$2,266	$1,818	$278	$1,539
TS7	778	$51	$11	$40	$35	$9	$27
TS9	781	$1,934	$224	$1,710	$1,336	$186	$1,150
US1	784	$76	$13	$62	$52	$12	$40
GW11-B	787	$0	$0	$0	$0	$0	$0
E1-B	790	$9	$13	($4)	$7	$11	($4)
BB7-B	793	$12	$16	($4)	$8	$13	($5)
BD1-B	796	$40	$1	$39	$30	$1	$29
BC	799	$20	$0	$20	$15	$0	$14
L2L-A	802	$35,650	$1,261	$34,389	$28,737	$1,237	$27,500
L2L-B	805	$15,497	$1,236	$14,261	$11,916	$1,146	$10,770
Total		**$1,541,270**	**$123,596**	**$1,417,670**	**$1,172,830**	**$114,757**	**$1,058,080**

Table 28
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
1-1AB	1	5	0.090	0.090	0.609	0.940	0.991	0.719	0.240	0.119	0.058	0.007	0.001
1-1AN	4	5	0.090	0.090	0.609	0.940	0.991	0.720	0.241	0.118	0.057	0.007	0.002
11BE1	7	3.963	0.038	0.039	0.330	0.699	0.865	0.992	0.528	0.283	0.143	0.050	0.022
11BE2	10	3.565	0.053	0.052	0.414	0.799	0.931	0.944	0.402	0.200	0.112	0.036	0.016
11BE3	13	3.114	0.077	0.074	0.539	0.902	0.979	0.749	0.209	0.128	0.085	0.025	0.011
11BE4	16	6	0.027	0.028	0.246	0.571	0.756	0.968	0.792	0.470	0.255	0.110	0.060
11BE5	19	4	0.066	0.064	0.483	0.862	0.963	0.847	0.337	0.178	0.102	0.034	0.014
11BE6-E	22	3.054	0.140	0.136	0.767	0.987	0.999	0.216	0.024	0.023	0.008	0.000	0.000
11BE6-W	25	6	0.050	0.052	0.411	0.796	0.929	0.921	0.539	0.264	0.128	0.023	0.004
1-1BU3-U1	28	4.082	0.028	0.031	0.269	0.609	0.791	0.998	0.671	0.387	0.245	0.011	0.000
1-1BU3-U2	31	1.85	0.439	0.440	0.997	1.000	1.000	0.004	0.001	0.001	0.001	0.000	0.000
1-1BU3-U3	34	4.112	0.027	0.030	0.261	0.596	0.779	0.998	0.692	0.402	0.253	0.011	0.000
11BU4	37	5.345	0.019	0.020	0.187	0.462	0.644	1.000	0.873	0.526	0.286	0.124	0.066
11BW11	40	3	0.126	0.123	0.730	0.980	0.999	0.353	0.061	0.056	0.047	0.016	0.007
11BW2-W1	43	6	0.015	0.016	0.151	0.388	0.559	1.000	0.951	0.638	0.372	0.179	0.103
11BW2-W2	46	5.388	0.019	0.020	0.184	0.457	0.638	1.000	0.879	0.533	0.291	0.128	0.069
11BW4-W3	49	5.238	0.020	0.021	0.194	0.476	0.659	1.000	0.855	0.507	0.272	0.117	0.061
11BW4-W4	52	4.347	0.031	0.032	0.274	0.618	0.799	0.999	0.637	0.347	0.175	0.064	0.030
11BW4-W4A	55	3.224	0.070	0.068	0.505	0.879	0.970	0.815	0.261	0.143	0.091	0.027	0.012
11BW5	58	5.5	0.032	0.033	0.284	0.633	0.812	0.962	0.699	0.396	0.207	0.087	0.042

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
11BW6	61	5.5	0.032	0.033	0.284	0.633	0.812	0.962	0.698	0.396	0.207	0.086	0.042
11BW79	64	6	0.050	0.052	0.411	0.795	0.929	0.921	0.541	0.265	0.129	0.024	0.005
11BW79-W7	67	5.5	0.032	0.033	0.284	0.633	0.812	0.962	0.698	0.396	0.207	0.086	0.042
1-2MID	70	6.208	0.047	0.048	0.391	0.774	0.916	0.958	0.436	0.201	0.087	0.016	0.003
1-2N	73	7.281	0.031	0.033	0.284	0.632	0.811	0.997	0.634	0.318	0.155	0.036	0.009
1-2S	76	4	0.199	0.194	0.884	0.998	1.000	0.126	0.011	0.011	0.011	0.003	0.000
1-3	79	6.5	0.077	0.078	0.554	0.911	0.982	0.826	0.354	0.175	0.092	0.017	0.004
1-5	82	3	0.514	0.514	0.999	1.000	1.000	0.009	0.002	0.002	0.002	0.000	0.000
1-7_N3-4	85	5.5	0.072	0.073	0.531	0.897	0.977	0.836	0.354	0.172	0.082	0.012	0.002
1-7_N4-7	88	5.5	0.072	0.073	0.531	0.897	0.977	0.836	0.354	0.172	0.082	0.012	0.002
1-7_N7-10	91	5.5	0.072	0.073	0.531	0.897	0.977	0.836	0.354	0.172	0.082	0.012	0.002
1-7-N10-13	94	5.5	0.072	0.073	0.531	0.897	0.977	0.836	0.352	0.173	0.082	0.012	0.002
1-7N13-16	97	5.5	0.072	0.073	0.531	0.897	0.977	0.836	0.352	0.172	0.082	0.012	0.002
1-7N16-17	100	5.5	0.072	0.073	0.529	0.895	0.977	0.839	0.357	0.174	0.083	0.011	0.002
1-7N17-24	103	5.5	0.072	0.073	0.531	0.897	0.977	0.836	0.352	0.173	0.082	0.012	0.002
1-7N24-28	106	5.5	0.072	0.073	0.531	0.897	0.977	0.836	0.352	0.173	0.082	0.012	0.002
1-8	109	4.82	0.051	0.053	0.417	0.802	0.933	0.930	0.394	0.186	0.089	0.012	0.002
2-1A2	112	0	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
2-1B2-MID	115	3.546	0.042	0.044	0.360	0.738	0.893	0.980	0.478	0.246	0.141	0.022	0.008
2-1B2N	118	4.275	0.025	0.026	0.235	0.552	0.738	1.000	0.747	0.420	0.233	0.049	0.020

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
2-1B2S	121	3.495	0.045	0.046	0.375	0.755	0.904	0.973	0.454	0.230	0.136	0.021	0.008
3-1B	124	9.5	0.032	0.034	0.295	0.650	0.826	0.952	0.815	0.525	0.307	0.101	0.036
3-1C	127	6	0.152	0.151	0.805	0.993	1.000	0.352	0.058	0.019	0.018	0.003	0.000
4-1N	130	4	0.359	0.355	0.987	1.000	1.000	0.024	0.002	0.002	0.002	0.000	0.000
4-1S	133	7	0.156	0.157	0.818	0.994	1.000	0.320	0.029	0.004	0.004	0.002	0.000
4-2	136	4	0.216	0.208	0.903	0.999	1.000	0.113	0.012	0.013	0.008	0.000	0.000
4-2A	139	6	0.108	0.107	0.679	0.967	0.997	0.635	0.182	0.093	0.033	0.005	0.000
4-2B	142	6	0.091	0.089	0.607	0.940	0.991	0.752	0.245	0.075	0.014	0.000	0.000
4-2C	145	6	0.091	0.089	0.605	0.938	0.990	0.755	0.254	0.074	0.010	0.000	0.000
4-7	148	6	0.074	0.076	0.545	0.906	0.981	0.818	0.342	0.161	0.079	0.012	0.002
4MGT	151	6	0.060	0.062	0.470	0.851	0.958	0.889	0.444	0.228	0.126	0.018	0.003
5-1A	154	6	0.102	0.101	0.655	0.959	0.995	0.666	0.206	0.103	0.046	0.007	0.002
5-1B	157	6	0.103	0.102	0.659	0.960	0.995	0.661	0.192	0.098	0.034	0.005	0.000
6-1B1	160	6	0.020	0.022	0.201	0.490	0.675	0.974	0.878	0.597	0.364	0.107	0.054
6-1B1-B	163	6	0.020	0.022	0.201	0.490	0.675	0.974	0.878	0.597	0.364	0.107	0.054
8-1N	166	4	0.230	0.222	0.919	0.999	1.000	0.074	0.005	0.006	0.005	0.002	0.000
8-1N-B	169	4	0.230	0.222	0.919	0.999	1.000	0.076	0.006	0.006	0.006	0.002	0.000
8-1S-B	175	4	0.228	0.221	0.917	0.999	1.000	0.082	0.006	0.008	0.007	0.003	0.000
8-2C	178	6	0.058	0.059	0.457	0.840	0.953	0.886	0.448	0.236	0.132	0.021	0.003
8-2D	181	6	0.154	0.153	0.811	0.993	1.000	0.331	0.052	0.016	0.015	0.000	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
9-1AE	184	8	0.011	0.012	0.116	0.310	0.461	0.984	0.957	0.865	0.659	0.327	0.204
9-1AMID	187	8	0.011	0.012	0.117	0.312	0.464	0.984	0.957	0.865	0.659	0.327	0.204
9-1AW	190	8	0.011	0.012	0.116	0.310	0.461	0.984	0.957	0.866	0.659	0.327	0.204
9-1BE	193	8	0.011	0.012	0.116	0.309	0.461	0.984	0.957	0.866	0.660	0.328	0.205
9-1BMIDE	196	8	0.011	0.012	0.116	0.310	0.461	0.984	0.957	0.866	0.659	0.327	0.204
9-1BMIDW	199	8	0.011	0.012	0.117	0.311	0.462	0.984	0.957	0.865	0.658	0.325	0.203
9-1BW	202	8	0.011	0.012	0.116	0.310	0.461	0.984	0.957	0.866	0.660	0.327	0.205
A1	205	2.194	0.158	0.149	0.801	0.992	1.000	0.172	0.020	0.019	0.018	0.003	0.002
B1	208	3.042	0.069	0.068	0.504	0.878	0.970	0.820	0.270	0.129	0.096	0.012	0.004
BB1	211	7.062	0.016	0.019	0.173	0.435	0.614	1.000	0.903	0.584	0.341	0.082	0.020
BB2	214	6.115	0.025	0.026	0.234	0.550	0.736	1.000	0.756	0.420	0.222	0.047	0.008
BB3	217	3.643	0.039	0.040	0.339	0.711	0.873	0.988	0.515	0.270	0.153	0.024	0.009
BB4	220	0	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BB5	223	4.193	0.027	0.028	0.246	0.572	0.757	1.000	0.718	0.398	0.220	0.044	0.018
BB6	226	1.837	0.314	0.309	0.975	1.000	1.000	0.022	0.003	0.003	0.005	0.000	0.000
BB7	229	3.052	0.068	0.067	0.500	0.875	0.969	0.825	0.275	0.131	0.096	0.013	0.004
BB8-B	235	3.109	0.130	0.128	0.746	0.984	0.999	0.270	0.033	0.020	0.018	0.002	0.000
BD1	238	4.569	0.064	0.065	0.491	0.869	0.966	0.826	0.295	0.135	0.093	0.012	0.002
BDL0	241	5.106	0.045	0.047	0.382	0.763	0.910	0.951	0.450	0.227	0.130	0.019	0.003
BDL1	244	5.523	0.035	0.037	0.315	0.678	0.849	0.987	0.567	0.304	0.165	0.027	0.005

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BDL2	247	4.263	0.129	0.127	0.744	0.983	0.999	0.261	0.029	0.019	0.019	0.004	0.000
BDL3	250	4.125	0.166	0.158	0.822	0.994	1.000	0.089	0.005	0.003	0.002	0.000	0.000
BDL4	253	2.737	0.454	0.456	0.998	1.000	1.000	0.002	0.000	0.000	0.000	0.000	0.000
BDL4-B	256	3.137	0.191	0.181	0.863	0.997	1.000	0.041	0.002	0.002	0.001	0.000	0.000
BDL5	259	2.436	0.746	0.745	1.000	1.000	1.000	0.000	0.000	0.000	0.001	0.000	0.000
BGC0	262	4.019	0.124	0.122	0.729	0.980	0.999	0.302	0.038	0.038	0.027	0.004	0.000
BGC1	265	3.515	0.179	0.169	0.843	0.996	1.000	0.066	0.004	0.004	0.003	0.000	0.000
BGC2	268	3.327	0.192	0.181	0.864	0.997	1.000	0.046	0.003	0.003	0.002	0.000	0.000
BGC3	271	2.971	0.623	0.623	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BGC4	274	2.938	0.567	0.566	1.000	1.000	1.000	0.001	0.000	0.000	0.000	0.000	0.000
BL1	277	0	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BL2	280	6	0.018	0.021	0.192	0.472	0.655	0.968	0.901	0.696	0.452	0.050	0.008
BL3	283	6	0.018	0.021	0.189	0.467	0.649	0.968	0.901	0.709	0.472	0.046	0.004
BL4	286	5	0.031	0.034	0.290	0.643	0.820	0.955	0.708	0.420	0.269	0.011	0.000
BL5	289	5	0.030	0.033	0.283	0.632	0.811	0.955	0.724	0.443	0.278	0.016	0.002
BL6	292	5	0.030	0.033	0.283	0.632	0.811	0.955	0.724	0.444	0.279	0.016	0.002
BL7	295	6	0.028	0.029	0.256	0.588	0.772	0.962	0.774	0.464	0.248	0.128	0.067
BL89	298	5	0.059	0.060	0.463	0.845	0.955	0.878	0.402	0.202	0.108	0.015	0.004
BPC1	301	6.853	0.036	0.038	0.321	0.687	0.856	0.991	0.557	0.268	0.125	0.026	0.006
BPC2	304	3.386	0.167	0.157	0.818	0.994	1.000	0.127	0.013	0.013	0.008	0.000	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BPC3	307	6	0.091	0.089	0.607	0.940	0.991	0.752	0.245	0.075	0.014	0.000	0.000
BPC4	310	6	0.091	0.089	0.605	0.938	0.990	0.755	0.254	0.074	0.010	0.000	0.000
BPC5	313	2.197	0.884	0.882	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BPC5-B	316	2.258	0.851	0.848	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT1	319	4.412	0.104	0.104	0.666	0.963	0.996	0.466	0.083	0.062	0.029	0.004	0.000
BT10	322	7.04	0.015	0.018	0.168	0.423	0.601	1.000	0.915	0.612	0.365	0.103	0.024
BT2	325	5.576	0.069	0.069	0.512	0.884	0.972	0.802	0.272	0.119	0.041	0.006	0.000
BT3	328	2.985	0.177	0.167	0.840	0.996	1.000	0.071	0.004	0.004	0.004	0.000	0.000
BT4	331	6	0.104	0.103	0.662	0.961	0.996	0.657	0.188	0.081	0.026	0.003	0.000
BT4-SA	334	7	0.153	0.153	0.809	0.993	1.000	0.354	0.049	0.010	0.010	0.002	0.000
BT5	337	2.948	0.173	0.159	0.824	0.995	1.000	0.156	0.021	0.017	0.000	0.000	0.000
BT5-B	340	3.254	0.151	0.141	0.782	0.990	1.000	0.231	0.034	0.022	0.000	0.000	0.000
BT6	343	4.366	0.069	0.070	0.515	0.886	0.973	0.795	0.262	0.120	0.059	0.007	0.000
BT6A	346	4.299	0.073	0.073	0.530	0.896	0.977	0.767	0.242	0.113	0.056	0.006	0.000
BT7	349	5.36	0.036	0.038	0.324	0.692	0.859	0.988	0.552	0.272	0.133	0.021	0.003
BT8	352	6.008	0.026	0.028	0.244	0.568	0.754	0.999	0.730	0.397	0.208	0.042	0.007
BT9	355	6.06	0.025	0.027	0.239	0.560	0.745	0.999	0.742	0.408	0.214	0.044	0.008
C1	358	3.114	0.065	0.063	0.481	0.860	0.962	0.858	0.301	0.143	0.101	0.013	0.005
C1-LF	361	4.157	0.027	0.028	0.250	0.578	0.763	1.000	0.707	0.391	0.217	0.043	0.017
CC1	364	3.485	0.121	0.119	0.718	0.978	0.998	0.334	0.047	0.035	0.028	0.004	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-01	367	10	0.055	0.058	0.451	0.835	0.950	0.913	0.606	0.333	0.179	0.029	0.006
D-06	370	2.918	0.264	0.252	0.945	1.000	1.000	0.032	0.002	0.002	0.002	0.000	0.000
D10	373	6	0.140	0.140	0.780	0.989	0.999	0.420	0.081	0.024	0.022	0.003	0.000
D-16N	376	3.044	0.069	0.068	0.503	0.877	0.970	0.821	0.272	0.129	0.095	0.012	0.004
D-16S	379	4	0.054	0.054	0.427	0.812	0.938	0.900	0.415	0.214	0.129	0.021	0.008
D-1732	382	2.956	0.075	0.073	0.532	0.898	0.978	0.766	0.225	0.113	0.088	0.011	0.004
D1A	385	2.792	0.086	0.085	0.590	0.931	0.988	0.639	0.150	0.088	0.074	0.009	0.003
D1B	388	3.087	0.066	0.065	0.489	0.867	0.965	0.844	0.289	0.138	0.099	0.013	0.005
D1b-LF	391	4.023	0.030	0.031	0.270	0.610	0.792	0.999	0.660	0.361	0.199	0.037	0.015
D1C	394	2.78	0.087	0.086	0.595	0.933	0.989	0.629	0.145	0.086	0.073	0.009	0.003
D1c-LF1	397	3.305	0.054	0.054	0.424	0.809	0.937	0.933	0.379	0.184	0.118	0.017	0.006
D1c-LF2	400	4.037	0.030	0.031	0.269	0.610	0.792	0.999	0.660	0.359	0.198	0.037	0.015
D1c-LF3	403	3.731	0.037	0.038	0.321	0.688	0.856	0.993	0.548	0.290	0.162	0.027	0.010
D-25	406	7	0.042	0.043	0.356	0.733	0.889	0.941	0.663	0.372	0.206	0.038	0.008
D-25-B	409	7	0.042	0.043	0.356	0.733	0.889	0.941	0.663	0.372	0.206	0.038	0.008
D-26	412	3.556	0.118	0.117	0.712	0.976	0.998	0.342	0.046	0.039	0.037	0.005	0.000
D-28	415	3.098	0.066	0.064	0.486	0.865	0.964	0.849	0.292	0.139	0.099	0.013	0.004
D-29	418	6.5	0.017	0.019	0.174	0.436	0.615	0.977	0.918	0.687	0.438	0.147	0.078
D-30	421	4	0.054	0.054	0.427	0.812	0.938	0.900	0.415	0.214	0.129	0.021	0.008
D-31	424	3.853	0.034	0.035	0.299	0.655	0.831	0.997	0.594	0.319	0.175	0.031	0.012

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-34N	427	3.032	0.070	0.068	0.507	0.880	0.971	0.814	0.264	0.128	0.095	0.012	0.004
D-34S	430	2.335	0.137	0.132	0.757	0.986	0.999	0.258	0.033	0.031	0.028	0.005	0.002
D-35	433	2.421	0.125	0.122	0.727	0.980	0.998	0.322	0.046	0.042	0.037	0.006	0.002
D-36	436	9.5	0.044	0.046	0.376	0.757	0.905	0.939	0.720	0.423	0.230	0.065	0.016
D-37	439	3.916	0.097	0.097	0.638	0.952	0.994	0.531	0.106	0.063	0.057	0.007	0.000
D-38	442	4.087	0.120	0.119	0.718	0.978	0.998	0.327	0.044	0.041	0.034	0.005	0.000
D-39-1	445	4.131	0.081	0.081	0.569	0.920	0.985	0.688	0.184	0.092	0.047	0.005	0.000
D-39-2	448	4.161	0.079	0.079	0.563	0.916	0.984	0.702	0.194	0.096	0.049	0.005	0.000
D-39-3	451	4.318	0.072	0.072	0.526	0.893	0.976	0.776	0.249	0.115	0.057	0.007	0.000
D-42	454	2.631	0.099	0.100	0.650	0.957	0.995	0.505	0.094	0.066	0.061	0.008	0.003
D-43	457	3.536	0.154	0.148	0.798	0.992	1.000	0.145	0.013	0.013	0.012	0.003	0.000
D-44	460	3.034	0.070	0.068	0.506	0.880	0.971	0.815	0.266	0.127	0.095	0.012	0.004
D-45	463	2.727	0.092	0.091	0.614	0.943	0.991	0.585	0.125	0.078	0.068	0.009	0.003
D-48	466	4	0.054	0.054	0.427	0.812	0.938	0.900	0.415	0.214	0.129	0.021	0.008
D-49	469	3.159	0.062	0.061	0.467	0.848	0.957	0.879	0.319	0.152	0.105	0.014	0.005
D-50	472	2.838	0.252	0.239	0.935	1.000	1.000	0.029	0.004	0.004	0.004	0.000	0.000
D-51	475	2.188	0.159	0.150	0.802	0.992	1.000	0.169	0.020	0.019	0.018	0.003	0.002
D-53	478	5	0.090	0.090	0.609	0.940	0.991	0.720	0.241	0.118	0.057	0.007	0.002
D-56	481	6	0.084	0.082	0.574	0.923	0.986	0.811	0.276	0.077	0.012	0.000	0.000
D-60	484	6	0.099	0.098	0.642	0.954	0.994	0.700	0.231	0.112	0.048	0.008	0.002

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-61	487	6	0.169	0.168	0.840	0.996	1.000	0.253	0.032	0.011	0.011	0.002	0.000
D-61-B	490	6	0.169	0.168	0.840	0.996	1.000	0.252	0.030	0.010	0.011	0.002	0.000
D-62-B	496	6	0.059	0.061	0.465	0.847	0.956	0.890	0.453	0.241	0.142	0.023	0.006
D-64	499	5	0.090	0.090	0.609	0.940	0.991	0.720	0.241	0.118	0.057	0.007	0.002
E1	502	2.636	0.175	0.165	0.835	0.995	1.000	0.094	0.007	0.007	0.007	0.000	0.000
E1-LF	505	4.075	0.029	0.030	0.263	0.600	0.783	0.999	0.675	0.369	0.203	0.039	0.016
E1-LF-B	508	3.323	0.053	0.053	0.417	0.802	0.933	0.940	0.391	0.190	0.120	0.017	0.006
E2	511	2.469	0.227	0.219	0.916	0.999	1.000	0.036	0.002	0.002	0.002	0.000	0.000
E2-B	514	2.18	0.543	0.544	1.000	1.000	1.000	0.000	0.000	0.001	0.000	0.000	0.000
E2-LF	517	5.4	0.070	0.071	0.522	0.891	0.975	0.830	0.345	0.170	0.097	0.014	0.003
E2-LF-B	520	5.4	0.071	0.072	0.528	0.895	0.977	0.831	0.351	0.175	0.100	0.016	0.004
FC	523	5.241	0.118	0.119	0.718	0.978	0.998	0.328	0.042	0.009	0.009	0.000	0.000
GW10	526	4.402	0.072	0.072	0.527	0.894	0.976	0.771	0.245	0.112	0.077	0.008	0.002
GW11	529	4.561	0.065	0.065	0.491	0.868	0.966	0.831	0.291	0.135	0.087	0.010	0.002
GW12	532	5.502	0.034	0.036	0.305	0.664	0.838	0.993	0.590	0.296	0.147	0.025	0.004
GW13	535	4.107	0.073	0.074	0.534	0.899	0.978	0.763	0.241	0.094	0.030	0.003	0.000
GW14	538	4.873	0.044	0.046	0.376	0.758	0.906	0.988	0.443	0.193	0.081	0.012	0.002
GW14-1	541	3.071	0.097	0.098	0.644	0.955	0.994	0.530	0.101	0.028	0.011	0.000	0.000
GW15	544	4.757	0.050	0.052	0.415	0.800	0.932	0.926	0.405	0.184	0.077	0.013	0.002
GW16	547	4.486	0.068	0.069	0.510	0.883	0.972	0.796	0.269	0.124	0.089	0.011	0.002

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
GW17	550	2.95	0.196	0.192	0.881	0.998	1.000	0.041	0.002	0.002	0.002	0.001	0.000
GW18	553	5.298	0.039	0.041	0.341	0.714	0.876	0.978	0.515	0.270	0.159	0.025	0.006
GW18-B	556	4.77	0.056	0.057	0.443	0.827	0.946	0.898	0.350	0.161	0.114	0.015	0.003
GW2	559	3.491	0.140	0.137	0.770	0.988	0.999	0.200	0.020	0.019	0.015	0.002	0.000
GW3	562	2.813	0.191	0.181	0.864	0.997	1.000	0.046	0.002	0.003	0.002	0.000	0.000
GW4	565	5.19	0.062	0.063	0.477	0.857	0.961	0.850	0.319	0.146	0.065	0.008	0.002
GW5	568	5.049	0.083	0.083	0.581	0.927	0.987	0.670	0.174	0.065	0.025	0.002	0.000
GW6	571	4.027	0.132	0.129	0.749	0.984	0.999	0.257	0.031	0.020	0.009	0.000	0.000
GW7	574	1.788	0.839	0.837	1.000	1.000	1.000	0.000	0.000	0.001	0.000	0.000	0.000
GW8	577	1.898	0.655	0.655	1.000	1.000	1.000	0.000	0.000	0.001	0.000	0.000	0.000
GW9	580	3.073	0.187	0.176	0.856	0.997	1.000	0.053	0.003	0.003	0.003	0.000	0.000
HC1	583	3.722	0.085	0.085	0.589	0.930	0.988	0.647	0.160	0.086	0.033	0.004	0.000
HC2	586	2.053	0.567	0.567	1.000	1.000	1.000	0.000	0.001	0.002	0.001	0.000	0.000
HC3	589	3.224	0.138	0.134	0.761	0.986	0.999	0.233	0.028	0.023	0.020	0.002	0.000
HC4	592	2.973	0.158	0.151	0.805	0.993	1.000	0.151	0.015	0.014	0.014	0.002	0.000
HNC0	595	3.139	0.182	0.171	0.847	0.996	1.000	0.066	0.004	0.004	0.004	0.002	0.000
HNC1	598	4.309	0.105	0.105	0.669	0.964	0.996	0.456	0.078	0.059	0.037	0.005	0.000
HNC10	601	3.662	0.169	0.161	0.827	0.995	1.000	0.086	0.005	0.001	0.001	0.000	0.000
HNC10-B	604	2.13	0.960	0.955	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC2	607	4.025	0.142	0.138	0.774	0.988	0.999	0.190	0.018	0.014	0.013	0.003	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
HNC3	610	3.518	0.199	0.200	0.892	0.999	1.000	0.030	0.001	0.001	0.001	0.000	0.000
HNC4	613	3.094	0.518	0.517	0.999	1.000	1.000	0.004	0.000	0.000	0.000	0.000	0.000
HNC5	616	4.566	0.120	0.120	0.720	0.978	0.998	0.321	0.040	0.026	0.026	0.003	0.000
HNC6	619	3.326	0.168	0.160	0.825	0.995	1.000	0.097	0.007	0.007	0.007	0.002	0.000
HNC7	622	3.558	0.153	0.147	0.796	0.991	1.000	0.149	0.013	0.013	0.012	0.003	0.000
HNC8	625	3.356	0.228	0.220	0.917	0.999	1.000	0.022	0.001	0.000	0.000	0.000	0.000
HNC9	628	3.494	0.267	0.256	0.948	1.000	1.000	0.021	0.000	0.000	0.000	0.000	0.000
HNC9-B	631	2.204	0.980	0.974	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9-E	634	2.857	0.757	0.754	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9-W	637	3.28	0.359	0.358	0.988	1.000	1.000	0.011	0.000	0.000	0.000	0.000	0.000
LB1	640	1	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LB2	643	5.065	0.079	0.078	0.558	0.914	0.983	0.713	0.197	0.104	0.043	0.006	0.002
LB3	646	1.709	0.994	0.990	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LB4	649	5.313	0.078	0.078	0.556	0.912	0.983	0.719	0.202	0.097	0.038	0.005	0.000
LB5	652	2.662	0.328	0.325	0.980	1.000	1.000	0.026	0.001	0.001	0.002	0.000	0.000
LBB2	655	1	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LBB3	658	6.205	0.023	0.025	0.226	0.536	0.722	1.000	0.775	0.437	0.234	0.051	0.009
LBB4	661	3.476	0.045	0.046	0.377	0.758	0.906	0.971	0.451	0.229	0.134	0.020	0.007
LBB5	664	5.012	0.016	0.018	0.167	0.422	0.599	1.000	0.918	0.598	0.353	0.095	0.044
LBB6	667	5.04	0.016	0.018	0.166	0.420	0.597	1.000	0.923	0.605	0.357	0.096	0.045

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
LBC1	670	6	0.060	0.062	0.470	0.851	0.958	0.889	0.444	0.228	0.126	0.018	0.003
LBC2	673	6	0.221	0.215	0.911	0.999	1.000	0.081	0.003	0.000	0.000	0.000	0.000
LF1	676	2.534	0.172	0.162	0.829	0.995	1.000	0.113	0.011	0.011	0.009	0.000	0.000
LF2	679	2.14	0.364	0.363	0.989	1.000	1.000	0.005	0.002	0.003	0.002	0.000	0.000
LF-GB	682	4.005	0.168	0.160	0.826	0.995	1.000	0.084	0.005	0.003	0.000	0.000	0.000
LL1	685	2.216	0.609	0.609	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LL2	688	1	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LL3	691	1.421	0.997	0.995	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
MC1	694	3.803	0.037	0.039	0.331	0.700	0.866	0.988	0.533	0.292	0.200	0.008	0.000
OB1	697	6.147	0.024	0.026	0.231	0.545	0.731	1.000	0.762	0.425	0.226	0.048	0.008
OB2	700	4.833	0.051	0.052	0.413	0.797	0.930	0.935	0.403	0.190	0.090	0.012	0.002
OB3	703	3.131	0.149	0.144	0.789	0.991	1.000	0.174	0.017	0.016	0.014	0.002	0.000
OB4	706	4.108	0.082	0.082	0.575	0.923	0.986	0.676	0.177	0.089	0.046	0.005	0.000
PAC1	709	10	0.053	0.056	0.435	0.820	0.942	0.921	0.598	0.321	0.166	0.033	0.009
SL1	712	4	0.157	0.151	0.806	0.993	1.000	0.119	0.008	0.003	0.002	0.000	0.000
SL2	715	6.071	0.074	0.076	0.547	0.907	0.981	0.734	0.220	0.086	0.048	0.006	0.002
SL3	718	10	0.053	0.055	0.434	0.819	0.942	0.920	0.630	0.347	0.186	0.037	0.010
TS1	721	4.565	0.018	0.021	0.193	0.475	0.658	1.000	0.865	0.555	0.341	0.021	0.002
TS10	724	4.111	0.027	0.030	0.263	0.600	0.782	0.998	0.686	0.397	0.250	0.012	0.000
TS11	727	3.138	0.072	0.073	0.530	0.896	0.977	0.783	0.210	0.075	0.073	0.003	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
TS12	730	2.17	0.183	0.173	0.850	0.997	1.000	0.090	0.008	0.003	0.003	0.000	0.000
TS13	733	2.293	0.163	0.155	0.815	0.994	1.000	0.141	0.014	0.005	0.005	0.000	0.000
TS14	736	2.543	0.128	0.125	0.738	0.982	0.999	0.297	0.040	0.013	0.012	0.000	0.000
TS15	739	3.672	0.043	0.044	0.365	0.744	0.897	0.975	0.463	0.235	0.181	0.006	0.000
TS16	742	3.651	0.044	0.045	0.370	0.751	0.901	0.972	0.454	0.227	0.178	0.006	0.000
TS17	745	3.557	0.048	0.049	0.397	0.781	0.920	0.956	0.403	0.191	0.165	0.005	0.000
TS18	748	2.653	0.114	0.113	0.699	0.973	0.998	0.392	0.062	0.020	0.019	0.000	0.000
TS19	751	4.099	0.061	0.061	0.469	0.850	0.958	0.872	0.321	0.152	0.066	0.013	0.003
TS2	754	2.461	0.139	0.135	0.765	0.987	0.999	0.238	0.029	0.010	0.009	0.000	0.000
TS20	757	3.79	0.076	0.076	0.547	0.907	0.981	0.737	0.212	0.106	0.048	0.008	0.002
TS21	760	5.228	0.029	0.031	0.268	0.608	0.790	0.999	0.670	0.348	0.171	0.047	0.014
TS22	763	4.002	0.066	0.066	0.492	0.869	0.966	0.836	0.290	0.136	0.060	0.011	0.003
TS3	766	2.534	0.129	0.126	0.740	0.982	0.999	0.294	0.041	0.014	0.013	0.000	0.000
TS4	769	3.121	0.073	0.074	0.536	0.900	0.978	0.772	0.204	0.072	0.070	0.003	0.000
TS5	772	3.016	0.081	0.081	0.572	0.922	0.986	0.695	0.169	0.055	0.053	0.002	0.000
TS6	775	2.846	0.094	0.095	0.632	0.950	0.993	0.554	0.112	0.033	0.032	0.002	0.000
TS7	778	5.015	0.013	0.016	0.149	0.383	0.553	1.000	0.955	0.694	0.431	0.038	0.005
TS9	781	3.257	0.065	0.065	0.491	0.868	0.966	0.852	0.258	0.101	0.096	0.003	0.000
US1	784	4.145	0.026	0.029	0.257	0.589	0.773	0.999	0.702	0.408	0.256	0.012	0.000
GW11-B	787	1	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
E1-B	790	4.593	0.047	0.049	0.396	0.780	0.920	0.951	0.418	0.200	0.100	0.014	0.002
BB7-B	793	3.36	0.051	0.051	0.409	0.794	0.928	0.947	0.400	0.197	0.123	0.018	0.007
BD1-B	796	4.177	0.083	0.083	0.581	0.926	0.987	0.658	0.173	0.086	0.072	0.008	0.002
BC	799	2.824	0.130	0.125	0.738	0.982	0.999	0.307	0.045	0.044	0.009	0.000	0.000
L2L-A	802	2.466	0.567	0.566	1.000	1.000	1.000	0.000	0.001	0.000	0.000	0.002	0.000
L2L-B	805	2.431	0.184	0.172	0.848	0.997	1.000	0.096	0.010	0.009	0.009	0.003	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
1-1AB	1	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
1-1AN	4	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BE1	7	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BE2	10	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BE3	13	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BE4	16	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BE5	19	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437
11BE6-E	22	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.996	0.912	0.663	0.436
11BE6-W	25	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437
1-1BU3-U1	28	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
1-1BU3-U2	31	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
1-1BU3-U3	34	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.996	0.912	0.663	0.436
11BU4	37	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW11	40	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW2-W1	43	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW2-W2	46	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW4-W3	49	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437
11BW4-W4	52	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW4-W4A	55	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW5	58	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
11BW6	61	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW79	64	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
11BW79-W7	67	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
1-2MID	70	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.876	0.572	0.287
1-2N	73	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-2S	76	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.876	0.573	0.287
1-3	79	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-5	82	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
1-7_N3-4	85	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-7_N4-7	88	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-7_N7-10	91	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-7-N10-13	94	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-7N13-16	97	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-7N16-17	100	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.574	0.288
1-7N17-24	103	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-7N24-28	106	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
1-8	109	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
2-1A2	112	12.132	0.002	0.004	0.040	0.115	0.185	1.000	1.000	0.997	0.912	0.663	0.436
2-1B2-MID	115	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.996	0.912	0.663	0.436
2-1B2N	118	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
2-1B2S	121	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
3-1B	124	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
3-1C	127	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.876	0.573	0.287
4-1N	130	18.53	0.003	0.005	0.044	0.127	0.203	1.000	1.000	0.999	0.909	0.571	0.327
4-1S	133	18.53	0.003	0.005	0.044	0.127	0.202	1.000	1.000	0.999	0.909	0.571	0.327
4-2	136	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
4-2A	139	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
4-2B	142	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
4-2C	145	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
4-7	148	18.221	0.003	0.005	0.048	0.138	0.220	1.000	1.000	0.996	0.877	0.559	0.294
4MGT	151	18.53	0.003	0.005	0.044	0.127	0.203	1.000	1.000	0.999	0.909	0.571	0.327
5-1A	154	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
5-1B	157	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
6-1B1	160	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
6-1B1-B	163	6	0.088	0.091	0.616	0.943	0.992	0.772	0.033	0.000	0.000	0.000	0.000
8-1N	166	15.996	0.004	0.005	0.049	0.139	0.220	1.000	1.000	0.995	0.883	0.557	0.263
8-1N-B	169	4	0.649	0.648	1.000	1.000	1.000	0.002	0.000	0.000	0.000	0.000	0.000
8-1S-B	175	4	0.649	0.648	1.000	1.000	1.000	0.001	0.000	0.000	0.000	0.000	0.000
8-2C	178	13.834	0.003	0.005	0.046	0.133	0.212	1.000	1.000	0.996	0.868	0.593	0.379
8-2D	181	13.834	0.003	0.005	0.047	0.133	0.212	1.000	1.000	0.995	0.868	0.591	0.377

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
9-1AE	184	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.405
9-1AMID	187	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.648	0.405
9-1AW	190	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.405
9-1BE	193	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.405
9-1BMIDE	196	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
9-1BMIDW	199	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
9-1BW	202	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
A1	205	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
B1	208	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
BB1	211	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BB2	214	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BB3	217	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437
BB4	220	12.132	0.002	0.004	0.039	0.111	0.179	1.000	1.000	0.996	0.912	0.664	0.437
BB5	223	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BB6	226	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
BB7	229	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
BB8-B	235	3.109	0.165	0.154	0.812	0.993	1.000	0.179	0.000	0.000	0.000	0.000	0.000
BD1	238	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BDL0	241	13.834	0.003	0.005	0.047	0.133	0.212	1.000	1.000	0.995	0.868	0.591	0.377
BDL1	244	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BDL2	247	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BDL3	250	13.834	0.003	0.005	0.047	0.133	0.212	1.000	1.000	0.995	0.868	0.591	0.377
BDL4	253	15.996	0.004	0.005	0.049	0.139	0.221	1.000	1.000	0.995	0.883	0.557	0.263
BDL4-B	256	3.137	0.812	0.809	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BDL5	259	13.834	0.003	0.005	0.047	0.133	0.212	1.000	1.000	0.995	0.868	0.591	0.377
BGC0	262	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
BGC1	265	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
BGC2	268	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
BGC3	271	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
BGC4	274	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
BL1	277	18.537	0.004	0.006	0.055	0.155	0.245	1.000	1.000	0.985	0.837	0.508	0.266
BL2	280	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
BL3	283	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
BL4	286	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
BL5	289	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BL6	292	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
BL7	295	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
BL89	298	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
BPC1	301	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
BPC2	304	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BPC3	307	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
BPC4	310	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.562	0.297
BPC5	313	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
BPC5-B	316	2.258	0.995	0.990	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT1	319	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
BT10	322	12.132	0.002	0.004	0.039	0.112	0.179	1.000	1.000	0.996	0.912	0.664	0.437
BT2	325	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
BT3	328	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.346
BT4	331	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
BT4-SA	334	18.53	0.003	0.005	0.044	0.127	0.203	1.000	1.000	0.999	0.909	0.571	0.327
BT5	337	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.346
BT5-B	340	3.254	0.935	0.932	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT6	343	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BT6A	346	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BT7	349	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BT8	352	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
BT9	355	12.132	0.002	0.004	0.039	0.112	0.179	1.000	1.000	0.997	0.913	0.664	0.437
C1	358	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
C1-LF	361	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437
CC1	364	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-01	367	18.53	0.003	0.005	0.044	0.127	0.203	1.000	1.000	0.999	0.909	0.571	0.327
D-06	370	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
D10	373	16.774	0.004	0.005	0.050	0.142	0.225	1.000	1.000	0.996	0.872	0.546	0.270
D-16N	376	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-16S	379	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-1732	382	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D1A	385	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.906	0.647	0.403
D1B	388	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.906	0.647	0.403
D1b-LF	391	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.906	0.649	0.406
D1C	394	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D1c-LF1	397	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D1c-LF2	400	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D1c-LF3	403	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-25	406	18.53	0.003	0.005	0.044	0.127	0.202	1.000	1.000	0.999	0.909	0.571	0.327
D-25-B	409	7	0.227	0.219	0.916	0.999	1.000	0.059	0.000	0.000	0.000	0.000	0.000
D-26	412	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-28	415	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-29	418	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-30	421	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-31	424	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-34N	427	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-34S	430	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-35	433	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-36	436	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
D-37	439	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
D-38	442	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-39-1	445	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-39-2	448	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-39-3	451	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-42	454	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-43	457	15.996	0.004	0.005	0.049	0.139	0.221	1.000	1.000	0.995	0.883	0.556	0.263
D-44	460	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-45	463	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-48	466	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-49	469	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.906	0.647	0.403
D-50	472	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-51	475	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
D-53	478	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
D-56	481	18.323	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.999	0.914	0.590	0.345
D-60	484	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-61	487	18.53	0.003	0.005	0.044	0.127	0.203	1.000	1.000	0.999	0.909	0.571	0.327
D-61-B	490	6	0.298	0.290	0.967	1.000	1.000	0.022	0.000	0.000	0.000	0.000	0.000
D-62-B	496	6	0.298	0.290	0.967	1.000	1.000	0.022	0.000	0.000	0.000	0.000	0.000
D-64	499	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
E1	502	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
E1-LF	505	11.432	0.003	0.004	0.040	0.116	0.185	1.000	1.000	1.000	0.906	0.647	0.404
E1-LF-B	508	3.323	0.150	0.141	0.782	0.990	1.000	0.232	0.000	0.000	0.000	0.000	0.000
E2	511	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.906	0.647	0.404
E2-B	514	2.18	0.786	0.784	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
E2-LF	517	11.432	0.003	0.004	0.040	0.116	0.186	1.000	1.000	1.000	0.905	0.649	0.406
E2-LF-B	520	5.4	0.109	0.109	0.686	0.969	0.997	0.627	0.006	0.000	0.000	0.000	0.000
FC	523	15.996	0.004	0.005	0.049	0.139	0.220	1.000	1.000	0.995	0.883	0.557	0.262
GW10	526	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
GW11	529	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
GW12	532	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
GW13	535	18.221	0.003	0.005	0.048	0.138	0.220	1.000	1.000	0.996	0.878	0.559	0.294
GW14	538	18.221	0.003	0.005	0.048	0.138	0.220	1.000	1.000	0.996	0.878	0.559	0.294
GW14-1	541	18.537	0.004	0.006	0.055	0.155	0.245	1.000	1.000	0.985	0.837	0.508	0.266
GW15	544	18.537	0.004	0.006	0.055	0.155	0.245	1.000	1.000	0.985	0.837	0.508	0.266
GW16	547	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
GW17	550	15.996	0.004	0.005	0.049	0.139	0.220	1.000	1.000	0.995	0.883	0.557	0.262
GW18	553	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
GW18-B	556	4.77	0.076	0.078	0.556	0.913	0.983	0.739	0.171	0.051	0.051	0.012	0.003
GW2	559	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
GW3	562	18.537	0.004	0.006	0.055	0.155	0.245	1.000	1.000	0.985	0.837	0.508	0.266
GW4	565	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.266
GW5	568	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
GW6	571	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
GW7	574	18.537	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.985	0.835	0.505	0.263
GW8	577	18.537	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.985	0.835	0.505	0.263
GW9	580	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.266
HC1	583	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
HC2	586	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
HC3	589	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
HC4	592	18.537	0.004	0.006	0.055	0.155	0.245	1.000	1.000	0.985	0.837	0.508	0.266
HNC0	595	15.996	0.004	0.005	0.049	0.139	0.220	1.000	1.000	0.995	0.883	0.557	0.263
HNC1	598	15.996	0.004	0.005	0.049	0.139	0.220	1.000	1.000	0.995	0.883	0.557	0.263
HNC10	601	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.562	0.297
HNC10-B	604	2.13	0.997	0.993	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC2	607	15.996	0.004	0.005	0.049	0.139	0.221	1.000	1.000	0.995	0.883	0.556	0.263

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
HNC3	610	15.996	0.004	0.005	0.049	0.139	0.221	1.000	1.000	0.995	0.883	0.556	0.263
HNC4	613	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
HNC5	616	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
HNC6	619	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.876	0.573	0.287
HNC7	622	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.573	0.287
HNC8	625	15.475	0.003	0.005	0.048	0.138	0.219	1.000	1.000	0.995	0.877	0.574	0.288
HNC9	628	16.774	0.004	0.005	0.050	0.143	0.227	1.000	1.000	0.996	0.871	0.543	0.266
HNC9-B	631	2.204	0.994	0.989	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9-E	634	16.774	0.004	0.005	0.050	0.142	0.225	1.000	1.000	0.996	0.873	0.547	0.270
HNC9-W	637	16.774	0.004	0.005	0.050	0.142	0.225	1.000	1.000	0.996	0.872	0.547	0.270
LB1	640	17.123	0.003	0.005	0.047	0.135	0.215	1.000	1.000	0.997	0.900	0.561	0.298
LB2	643	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
LB3	646	17.123	0.003	0.005	0.046	0.132	0.210	1.000	1.000	0.998	0.902	0.561	0.295
LB4	649	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.563	0.297
LB5	652	17.123	0.003	0.005	0.046	0.131	0.209	1.000	1.000	0.998	0.902	0.562	0.297
LBB2	655	12.132	0.002	0.004	0.039	0.112	0.179	1.000	1.000	0.997	0.912	0.663	0.436
LBB3	658	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437
LBB4	661	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
LBB5	664	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
LBB6	667	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.663	0.437

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
LBC1	670	18.53	0.003	0.005	0.044	0.127	0.203	1.000	1.000	0.999	0.909	0.570	0.325
LBC2	673	18.53	0.003	0.005	0.044	0.127	0.203	1.000	1.000	0.999	0.909	0.570	0.325
LF1	676	18.537	0.004	0.006	0.055	0.155	0.245	1.000	1.000	0.985	0.837	0.508	0.266
LF2	679	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
LF-GB	682	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
LL1	685	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
LL2	688	18.537	0.004	0.006	0.056	0.158	0.250	1.000	1.000	0.985	0.836	0.509	0.268
LL3	691	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.836	0.506	0.265
MC1	694	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
OB1	697	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
OB2	700	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
OB3	703	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
OB4	706	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
PAC1	709	18.221	0.003	0.005	0.048	0.138	0.220	1.000	1.000	0.996	0.877	0.559	0.294
SL1	712	18.221	0.003	0.005	0.048	0.138	0.220	1.000	1.000	0.996	0.878	0.559	0.294
SL2	715	18.221	0.003	0.005	0.048	0.138	0.220	1.000	1.000	0.996	0.877	0.559	0.294
SL3	718	18.221	0.003	0.005	0.048	0.138	0.220	1.000	1.000	0.996	0.878	0.559	0.294
TS1	721	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS10	724	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS11	727	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
TS12	730	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS13	733	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS14	736	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS15	739	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS16	742	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS17	745	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS18	748	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS19	751	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS2	754	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS20	757	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS21	760	18.537	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.985	0.835	0.505	0.263
TS22	763	18.537	0.004	0.006	0.055	0.155	0.245	1.000	1.000	0.985	0.837	0.508	0.266
TS3	766	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS4	769	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS5	772	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS6	775	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS7	778	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
TS9	781	12.132	0.002	0.004	0.039	0.112	0.180	1.000	1.000	0.997	0.912	0.664	0.437
US1	784	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.266
GW11-B	787	1	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 28 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2035 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
E1-B	790	4.593	0.086	0.088	0.602	0.937	0.990	0.660	0.003	0.000	0.000	0.000	0.000
BB7-B	793	3.36	0.147	0.139	0.777	0.989	0.999	0.242	0.000	0.000	0.000	0.000	0.000
BD1-B	796	4.177	0.102	0.103	0.664	0.962	0.996	0.484	0.073	0.014	0.014	0.006	0.000
BC	799	17.123	0.003	0.005	0.046	0.132	0.210	1.000	1.000	0.998	0.901	0.559	0.294
L2L-A	802	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267
L2L-B	805	18.537	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.985	0.837	0.508	0.267

Table 29
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
1-1AB	1	5	0.502	0.500	0.999	1.000	1.000	0.012	0.000	0.001	0.000	0.000	0.000
1-1AN	4	5	0.503	0.499	0.999	1.000	1.000	0.012	0.000	0.000	0.000	0.000	0.000
11BE1	7	5.571	0.142	0.139	0.775	0.989	0.999	0.198	0.020	0.003	0.002	0.000	0.000
11BE2	10	4.555	0.269	0.258	0.949	1.000	1.000	0.030	0.002	0.000	0.000	0.000	0.000
11BE3	13	4.06	0.564	0.563	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
11BE4	16	6	0.233	0.227	0.924	1.000	1.000	0.117	0.012	0.002	0.002	0.000	0.000
11BE5	19	4	0.858	0.857	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
11BE6-E	22	3.472	0.856	0.854	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
11BE6-W	25	6	0.218	0.213	0.909	0.999	1.000	0.156	0.018	0.004	0.005	0.000	0.000
1-1BU3-U1	28	7.265	0.083	0.085	0.588	0.930	0.988	0.655	0.168	0.060	0.020	0.003	0.000
1-1BU3-U2	31	6.233	0.124	0.123	0.732	0.981	0.999	0.292	0.035	0.017	0.006	0.000	0.000
1-1BU3-U3	34	6.92	0.096	0.097	0.640	0.953	0.994	0.534	0.107	0.039	0.013	0.002	0.000
11BU4	37	7.407	0.061	0.065	0.487	0.865	0.965	0.856	0.260	0.080	0.034	0.000	0.000
11BW11	40	3	0.991	0.988	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
11BW2-W1	43	7.012	0.075	0.077	0.553	0.911	0.982	0.742	0.174	0.044	0.018	0.000	0.000
11BW2-W2	46	6.56	0.092	0.094	0.627	0.948	0.993	0.572	0.102	0.022	0.010	0.000	0.000
11BW4-W3	49	6.487	0.095	0.097	0.641	0.954	0.994	0.540	0.090	0.018	0.007	0.000	0.000
11BW4-W4	52	5.111	0.171	0.162	0.830	0.995	1.000	0.096	0.008	0.000	0.000	0.000	0.000
11BW4-W4A	55	3.452	0.867	0.865	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
11BW5	58	5.5	0.303	0.295	0.970	1.000	1.000	0.051	0.004	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
11BW6	61	5.5	0.303	0.296	0.970	1.000	1.000	0.051	0.004	0.000	0.000	0.000	0.000
11BW79	64	6	0.218	0.212	0.908	0.999	1.000	0.160	0.019	0.005	0.005	0.000	0.000
11BW79-W7	67	5.5	0.303	0.296	0.970	1.000	1.000	0.051	0.004	0.000	0.000	0.000	0.000
1-2MID	70	6.619	0.167	0.160	0.825	0.995	1.000	0.065	0.002	0.001	0.000	0.000	0.000
1-2N	73	7.599	0.132	0.132	0.757	0.986	0.999	0.213	0.016	0.003	0.003	0.000	0.000
1-2S	76	4	0.992	0.988	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
1-3	79	6.5	0.290	0.283	0.964	1.000	1.000	0.036	0.002	0.001	0.001	0.000	0.000
1-5	82	3	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
1-7_N3-4	85	5.5	0.333	0.327	0.981	1.000	1.000	0.033	0.002	0.001	0.002	0.000	0.000
1-7_N4-7	88	5.5	0.333	0.327	0.981	1.000	1.000	0.033	0.002	0.001	0.002	0.000	0.000
1-7_N7-10	91	5.5	0.333	0.327	0.981	1.000	1.000	0.033	0.002	0.001	0.002	0.000	0.000
1-7-N10-13	94	5.5	0.333	0.327	0.981	1.000	1.000	0.033	0.002	0.001	0.002	0.000	0.000
1-7N13-16	97	5.5	0.333	0.327	0.981	1.000	1.000	0.032	0.002	0.001	0.002	0.000	0.000
1-7N16-17	100	5.5	0.334	0.328	0.981	1.000	1.000	0.030	0.001	0.001	0.001	0.000	0.000
1-7N17-24	103	5.5	0.333	0.327	0.981	1.000	1.000	0.033	0.002	0.001	0.002	0.000	0.000
1-7N24-28	106	5.5	0.333	0.327	0.981	1.000	1.000	0.033	0.002	0.001	0.002	0.000	0.000
1-8	109	5.616	0.154	0.149	0.800	0.992	1.000	0.133	0.010	0.005	0.003	0.000	0.000
2-1A2	112	9.13	0.025	0.028	0.246	0.572	0.757	0.999	0.738	0.385	0.159	0.057	0.015
2-1B2-MID	115	5.896	0.117	0.117	0.710	0.976	0.998	0.358	0.053	0.011	0.000	0.000	0.000
2-1B2N	118	5.308	0.152	0.147	0.795	0.991	1.000	0.164	0.016	0.004	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
2-1B2S	121	4.551	0.243	0.231	0.928	1.000	1.000	0.041	0.003	0.000	0.000	0.000	0.000
3-1B	124	9.5	0.123	0.125	0.737	0.982	0.999	0.672	0.203	0.079	0.060	0.010	0.002
3-1C	127	6	0.329	0.321	0.979	1.000	1.000	0.026	0.001	0.001	0.001	0.000	0.000
4-1N	130	4	0.982	0.977	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
4-1S	133	7	0.256	0.249	0.943	1.000	1.000	0.060	0.003	0.001	0.000	0.000	0.000
4-2	136	4	0.996	0.993	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
4-2A	139	6	0.518	0.513	0.999	1.000	1.000	0.006	0.000	0.000	0.000	0.000	0.000
4-2B	142	6	0.682	0.681	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
4-2C	145	6	0.713	0.711	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
4-7	148	6	0.322	0.315	0.977	1.000	1.000	0.035	0.003	0.000	0.000	0.000	0.000
4MGT	151	6	0.292	0.284	0.965	1.000	1.000	0.043	0.002	0.002	0.002	0.000	0.000
5-1A	154	6	0.425	0.420	0.996	1.000	1.000	0.013	0.000	0.000	0.000	0.000	0.000
5-1B	157	6	0.562	0.560	1.000	1.000	1.000	0.005	0.000	0.000	0.000	0.000	0.000
6-1B1	160	6	0.225	0.218	0.914	0.999	1.000	0.148	0.017	0.011	0.004	0.000	0.000
6-1B1-B	163	6	0.224	0.218	0.914	0.999	1.000	0.148	0.017	0.011	0.004	0.000	0.000
8-1N	166	4	0.977	0.973	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
8-1N-B	169	4	0.977	0.972	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
8-1S-B	175	4	0.969	0.966	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
8-2C	178	6	0.292	0.286	0.965	1.000	1.000	0.041	0.002	0.002	0.000	0.000	0.000
8-2D	181	6	0.353	0.347	0.986	1.000	1.000	0.020	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
9-1AE	184	8	0.121	0.122	0.729	0.980	0.999	0.694	0.220	0.052	0.005	0.002	0.000
9-1AMID	187	8	0.121	0.122	0.729	0.980	0.999	0.694	0.220	0.052	0.005	0.002	0.000
9-1AW	190	8	0.121	0.122	0.729	0.980	0.999	0.694	0.220	0.052	0.005	0.002	0.000
9-1BE	193	8	0.121	0.122	0.729	0.980	0.999	0.693	0.219	0.051	0.005	0.002	0.000
9-1BMIDE	196	8	0.121	0.122	0.728	0.980	0.998	0.697	0.223	0.053	0.006	0.002	0.000
9-1BMIDW	199	8	0.121	0.122	0.728	0.980	0.999	0.697	0.223	0.053	0.006	0.002	0.000
9-1BW	202	8	0.121	0.122	0.729	0.980	0.999	0.694	0.220	0.052	0.005	0.002	0.000
A1	205	2.625	0.990	0.985	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
B1	208	3.495	0.831	0.829	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BB1	211	8.351	0.069	0.072	0.527	0.894	0.976	0.774	0.233	0.088	0.041	0.006	0.002
BB2	214	7.324	0.080	0.083	0.578	0.925	0.987	0.676	0.176	0.060	0.023	0.002	0.000
BB3	217	5.492	0.140	0.137	0.771	0.988	0.999	0.215	0.024	0.005	0.000	0.000	0.000
BB4	220	9.051	0.026	0.029	0.254	0.586	0.770	0.999	0.720	0.364	0.145	0.051	0.013
BB5	223	5.683	0.129	0.127	0.742	0.983	0.999	0.282	0.036	0.008	0.000	0.000	0.000
BB6	226	2.676	0.988	0.983	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BB7	229	3.502	0.828	0.825	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BB8-B	235	4.031	0.547	0.547	1.000	1.000	1.000	0.000	0.001	0.000	0.000	0.000	0.000
BD1	238	5.223	0.191	0.182	0.865	0.998	1.000	0.037	0.001	0.001	0.001	0.000	0.000
BDL0	241	5.282	0.186	0.175	0.854	0.997	1.000	0.048	0.002	0.002	0.000	0.000	0.000
BDL1	244	6.081	0.149	0.145	0.791	0.991	1.000	0.148	0.012	0.007	0.003	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BDL2	247	4.352	0.790	0.788	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BDL3	250	4.224	0.816	0.813	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BDL4	253	3.03	0.996	0.993	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BDL4-B	256	3.312	0.986	0.981	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BDL5	259	3	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BGC0	262	4.12	0.951	0.947	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BGC1	265	3.679	0.987	0.982	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BGC2	268	3.402	0.997	0.994	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BGC3	271	3.087	0.995	0.991	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BGC4	274	3.083	0.987	0.982	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BL1	277	2	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BL2	280	6	0.253	0.245	0.940	1.000	1.000	0.074	0.005	0.004	0.003	0.000	0.000
BL3	283	6	0.239	0.232	0.929	1.000	1.000	0.092	0.007	0.005	0.004	0.000	0.000
BL4	286	5	0.505	0.502	0.999	1.000	1.000	0.012	0.000	0.000	0.000	0.000	0.000
BL5	289	5	0.503	0.500	0.999	1.000	1.000	0.010	0.001	0.000	0.000	0.000	0.000
BL6	292	5	0.503	0.499	0.999	1.000	1.000	0.011	0.000	0.000	0.000	0.000	0.000
BL7	295	6	0.267	0.259	0.950	1.000	1.000	0.065	0.005	0.002	0.000	0.000	0.000
BL89	298	5	0.443	0.437	0.997	1.000	1.000	0.016	0.001	0.001	0.001	0.000	0.000
BPC1	301	7.069	0.150	0.147	0.796	0.991	1.000	0.120	0.006	0.001	0.001	0.000	0.000
BPC2	304	3.439	0.998	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BPC3	307	6	0.682	0.681	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BPC4	310	6	0.713	0.711	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BPC5	313	2.305	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BPC5-B	316	2.617	0.998	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT1	319	4.787	0.774	0.771	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT10	322	10.162	0.020	0.024	0.212	0.511	0.697	0.999	0.808	0.492	0.271	0.062	0.011
BT2	325	5.985	0.187	0.177	0.857	0.997	1.000	0.036	0.000	0.000	0.000	0.000	0.000
BT3	328	3.15	0.988	0.983	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT4	331	6	0.601	0.599	1.000	1.000	1.000	0.003	0.000	0.000	0.000	0.000	0.000
BT4-SA	334	7	0.256	0.249	0.943	1.000	1.000	0.060	0.003	0.001	0.000	0.000	0.000
BT5	337	3.019	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT5-B	340	3.293	0.999	0.997	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT6	343	6.434	0.116	0.116	0.707	0.975	0.998	0.359	0.050	0.018	0.009	0.000	0.000
BT6A	346	5.689	0.150	0.146	0.793	0.991	1.000	0.148	0.012	0.006	0.003	0.000	0.000
BT7	349	7.205	0.085	0.087	0.597	0.935	0.989	0.634	0.156	0.051	0.020	0.002	0.000
BT8	352	8.545	0.045	0.049	0.392	0.775	0.917	0.944	0.435	0.188	0.081	0.010	0.001
BT9	355	9.247	0.032	0.035	0.301	0.658	0.833	0.988	0.612	0.304	0.145	0.023	0.003
C1	358	3.564	0.802	0.799	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
C1-LF	361	5.57	0.136	0.133	0.759	0.986	0.999	0.239	0.028	0.006	0.000	0.000	0.000
CC1	364	4.007	0.762	0.759	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-01	367	10	0.124	0.127	0.742	0.983	0.999	0.673	0.180	0.059	0.054	0.004	0.000
D-06	370	3.105	0.986	0.980	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D10	373	6	0.300	0.293	0.969	1.000	1.000	0.047	0.003	0.002	0.002	0.000	0.000
D-16N	376	3.343	0.884	0.882	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-16S	379	4	0.839	0.837	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-1732	382	3.295	0.898	0.896	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D1A	385	3.366	0.877	0.875	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D1B	388	3.167	0.930	0.927	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D1b-LF	391	4.489	0.274	0.264	0.954	1.000	1.000	0.032	0.002	0.000	0.000	0.000	0.000
D1C	394	3.122	0.939	0.936	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D1c-LF1	397	4.194	0.446	0.444	0.997	1.000	1.000	0.001	0.001	0.000	0.000	0.000	0.000
D1c-LF2	400	4.932	0.178	0.168	0.841	0.996	1.000	0.090	0.008	0.003	0.000	0.000	0.000
D1c-LF3	403	5.241	0.157	0.150	0.803	0.992	1.000	0.150	0.015	0.004	0.000	0.000	0.000
D-25	406	7	0.225	0.220	0.916	0.999	1.000	0.107	0.008	0.006	0.006	0.000	0.000
D-25-B	409	7	0.233	0.227	0.924	1.000	1.000	0.071	0.003	0.002	0.002	0.000	0.000
D-26	412	3.913	0.861	0.858	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-28	415	4.165	0.463	0.463	0.998	1.000	1.000	0.001	0.001	0.000	0.000	0.000	0.000
D-29	418	6.5	0.190	0.187	0.873	0.998	1.000	0.264	0.040	0.009	0.000	0.000	0.000
D-30	421	4	0.839	0.837	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-31	424	4.49	0.273	0.263	0.952	1.000	1.000	0.034	0.002	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-34N	427	3.217	0.918	0.917	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-34S	430	2.68	0.987	0.982	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-35	433	2.779	0.981	0.976	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-36	436	9.5	0.146	0.147	0.797	0.992	1.000	0.508	0.119	0.039	0.037	0.006	0.000
D-37	439	4.067	0.791	0.788	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-38	442	4.418	0.807	0.804	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-39-1	445	4.976	0.189	0.180	0.862	0.997	1.000	0.047	0.003	0.002	0.000	0.000	0.000
D-39-2	448	5.196	0.177	0.167	0.840	0.996	1.000	0.070	0.004	0.003	0.002	0.000	0.000
D-39-3	451	5.233	0.175	0.165	0.836	0.996	1.000	0.075	0.005	0.003	0.002	0.000	0.000
D-42	454	3.276	0.904	0.902	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-43	457	3.684	0.984	0.978	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-44	460	3.295	0.898	0.897	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-45	463	2.991	0.960	0.955	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-48	466	4	0.839	0.837	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-49	469	3.433	0.855	0.852	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-50	472	3	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-51	475	2.785	0.981	0.975	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-53	478	5	0.503	0.499	0.999	1.000	1.000	0.012	0.000	0.000	0.000	0.000	0.000
D-56	481	6	0.713	0.711	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
D-60	484	6	0.562	0.560	1.000	1.000	1.000	0.005	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-61	487	6	0.390	0.385	0.992	1.000	1.000	0.017	0.001	0.000	0.000	0.000	0.000
D-61-B	490	6	0.390	0.386	0.992	1.000	1.000	0.016	0.001	0.000	0.000	0.000	0.000
D-62-B	496	6	0.286	0.278	0.962	1.000	1.000	0.047	0.003	0.002	0.002	0.000	0.000
D-64	499	5	0.502	0.499	0.999	1.000	1.000	0.012	0.000	0.000	0.000	0.000	0.000
E1	502	3.152	0.958	0.953	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
E1-LF	505	4.766	0.191	0.182	0.865	0.998	1.000	0.063	0.005	0.005	0.002	0.000	0.000
E1-LF-B	508	4.054	0.532	0.534	1.000	1.000	1.000	0.000	0.001	0.000	0.000	0.000	0.000
E2	511	2.679	0.998	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
E2-B	514	2.324	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
E2-LF	517	5.4	0.443	0.439	0.997	1.000	1.000	0.016	0.001	0.000	0.000	0.000	0.000
E2-LF-B	520	5.4	0.443	0.440	0.997	1.000	1.000	0.015	0.001	0.000	0.000	0.000	0.000
FC	523	5.279	0.196	0.195	0.886	0.999	1.000	0.028	0.001	0.001	0.001	0.000	0.000
GW10	526	5.283	0.186	0.175	0.854	0.997	1.000	0.048	0.003	0.002	0.002	0.000	0.000
GW11	529	5.94	0.155	0.150	0.803	0.992	1.000	0.124	0.009	0.004	0.004	0.000	0.000
GW12	532	7.035	0.091	0.093	0.622	0.946	0.992	0.577	0.128	0.043	0.018	0.002	0.000
GW13	535	4.687	0.206	0.205	0.899	0.999	1.000	0.045	0.003	0.001	0.001	0.000	0.000
GW14	538	5.493	0.179	0.169	0.843	0.996	1.000	0.082	0.006	0.001	0.001	0.000	0.000
GW14-1	541	3.271	0.973	0.967	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GW15	544	5.325	0.171	0.162	0.829	0.995	1.000	0.097	0.008	0.002	0.001	0.000	0.000
GW16	547	5.337	0.183	0.173	0.850	0.997	1.000	0.051	0.002	0.002	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
GW17	550	3.202	0.999	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GW18	553	6.016	0.148	0.144	0.789	0.991	1.000	0.154	0.013	0.007	0.007	0.000	0.000
GW18-B	556	5	0.200	0.204	0.898	0.999	1.000	0.028	0.001	0.001	0.001	0.000	0.000
GW2	559	3.6	0.943	0.940	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GW3	562	3.086	0.991	0.986	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GW4	565	5.489	0.190	0.184	0.869	0.998	1.000	0.035	0.001	0.000	0.000	0.000	0.000
GW5	568	5.137	0.331	0.326	0.981	1.000	1.000	0.009	0.000	0.000	0.000	0.000	0.000
GW6	571	4.051	0.895	0.893	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GW7	574	2	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GW8	577	2	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GW9	580	3.224	0.991	0.987	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HC1	583	4.456	0.323	0.318	0.978	1.000	1.000	0.015	0.002	0.000	0.000	0.000	0.000
HC2	586	2.316	0.998	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HC3	589	3.47	0.907	0.905	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HC4	592	3.158	0.961	0.957	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC0	595	3.301	0.998	0.995	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC1	598	4.516	0.660	0.659	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC10	601	3.857	0.775	0.773	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC10-B	604	2.369	0.998	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC2	607	4.109	0.883	0.880	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
HNC3	610	3.68	0.960	0.955	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC4	613	3.211	0.993	0.989	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC5	616	4.726	0.680	0.678	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC6	619	3.537	0.992	0.987	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC7	622	3.827	0.971	0.965	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC8	625	3.534	0.945	0.942	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9	628	3.564	0.881	0.878	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9-B	631	2.52	0.997	0.995	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9-E	634	3.046	0.973	0.968	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9-W	637	3.39	0.950	0.948	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LB1	640	3	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LB2	643	5.076	0.616	0.616	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LB3	646	3	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LB4	649	5.083	0.562	0.562	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LB5	652	2.833	0.998	0.997	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LBB2	655	10.053	0.022	0.025	0.221	0.527	0.713	0.999	0.790	0.469	0.254	0.056	0.010
LBB3	658	7.839	0.064	0.067	0.498	0.874	0.968	0.824	0.270	0.104	0.040	0.004	0.000
LBB4	661	7.284	0.061	0.063	0.480	0.859	0.962	0.868	0.301	0.074	0.008	0.002	0.000
LBB5	664	6.65	0.082	0.083	0.582	0.927	0.987	0.674	0.172	0.034	0.002	0.000	0.000
LBB6	667	7.093	0.067	0.069	0.510	0.882	0.972	0.820	0.262	0.059	0.005	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
LBC1	670	6	0.292	0.284	0.965	1.000	1.000	0.043	0.002	0.002	0.002	0.000	0.000
LBC2	673	6	0.469	0.465	0.998	1.000	1.000	0.010	0.000	0.000	0.000	0.000	0.000
LF1	676	2.767	0.990	0.985	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LF2	679	2.331	0.999	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LF-GB	682	4.063	0.805	0.803	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LL1	685	2.227	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LL2	688	2	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LL3	691	2	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
MC1	694	4.334	0.473	0.473	0.998	1.000	1.000	0.005	0.000	0.000	0.000	0.000	0.000
OB1	697	8	0.059	0.062	0.473	0.854	0.959	0.861	0.304	0.122	0.049	0.005	0.000
OB2	700	6.521	0.112	0.113	0.698	0.972	0.997	0.385	0.056	0.019	0.008	0.000	0.000
OB3	703	3.925	0.729	0.728	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
OB4	706	4.52	0.353	0.351	0.987	1.000	1.000	0.019	0.001	0.001	0.000	0.000	0.000
PAC1	709	10	0.134	0.137	0.770	0.988	0.999	0.605	0.132	0.035	0.037	0.004	0.000
SL1	712	4.086	0.795	0.792	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
SL2	715	6.163	0.162	0.156	0.817	0.994	1.000	0.093	0.005	0.001	0.001	0.000	0.000
SL3	718	10	0.136	0.139	0.777	0.989	0.999	0.581	0.118	0.030	0.032	0.005	0.000
TS1	721	9.125	0.035	0.037	0.317	0.681	0.851	0.984	0.576	0.280	0.121	0.030	0.005
TS10	724	5.944	0.138	0.135	0.766	0.987	0.999	0.208	0.020	0.011	0.004	0.000	0.000
TS11	727	4.195	0.564	0.564	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
TS12	730	3.615	0.869	0.867	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
TS13	733	3.791	0.797	0.795	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
TS14	736	3.856	0.765	0.763	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
TS15	739	6.086	0.131	0.129	0.750	0.984	0.999	0.247	0.026	0.014	0.005	0.000	0.000
TS16	742	5.234	0.175	0.165	0.836	0.996	1.000	0.076	0.005	0.004	0.002	0.000	0.000
TS17	745	4.831	0.198	0.199	0.891	0.999	1.000	0.036	0.002	0.002	0.000	0.000	0.000
TS18	748	3.641	0.860	0.857	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
TS19	751	4.516	0.291	0.282	0.964	1.000	1.000	0.022	0.001	0.000	0.000	0.000	0.000
TS2	754	5.749	0.147	0.143	0.787	0.990	1.000	0.162	0.014	0.008	0.003	0.000	0.000
TS20	757	4.07	0.562	0.562	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
TS21	760	6.312	0.107	0.108	0.679	0.967	0.997	0.440	0.063	0.012	0.012	0.000	0.000
TS22	763	4.558	0.269	0.257	0.949	1.000	1.000	0.027	0.002	0.000	0.000	0.000	0.000
TS3	766	4.442	0.402	0.401	0.994	1.000	1.000	0.012	0.000	0.000	0.000	0.000	0.000
TS4	769	4.682	0.259	0.247	0.942	1.000	1.000	0.026	0.001	0.001	0.000	0.000	0.000
TS5	772	5.44	0.163	0.156	0.817	0.994	1.000	0.103	0.007	0.005	0.002	0.000	0.000
TS6	775	5.149	0.179	0.169	0.844	0.996	1.000	0.065	0.004	0.004	0.002	0.000	0.000
TS7	778	7.127	0.088	0.090	0.609	0.940	0.991	0.606	0.144	0.051	0.017	0.003	0.000
TS9	781	4.827	0.198	0.198	0.890	0.999	1.000	0.036	0.002	0.002	0.000	0.000	0.000
US1	784	6.04	0.133	0.131	0.755	0.985	0.999	0.234	0.024	0.013	0.005	0.000	0.000
GW11-B	787	2	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 Without Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
E1-B	790	4.877	0.195	0.192	0.881	0.998	1.000	0.048	0.003	0.003	0.000	0.000	0.000
BB7-B	793	3.56	0.804	0.801	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BD1-B	796	4.31	0.649	0.648	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BC	799	3	0.999	0.999	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
L2L-A	802	2.691	0.998	0.995	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
L2L-B	805	3.529	0.798	0.795	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
1-1AB	1	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
1-1AN	4	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BE1	7	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BE2	10	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BE3	13	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BE4	16	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BE5	19	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
11BE6-E	22	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.561	0.343
11BE6-W	25	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
1-1BU3-U1	28	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
1-1BU3-U2	31	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
1-1BU3-U3	34	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
11BU4	37	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW11	40	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW2-W1	43	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW2-W2	46	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW4-W3	49	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW4-W4	52	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW4-W4A	55	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW5	58	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
11BW6	61	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW79	64	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
11BW79-W7	67	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
1-2MID	70	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.327
1-2N	73	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-2S	76	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.327
1-3	79	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-5	82	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
1-7_N3-4	85	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-7_N4-7	88	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-7_N7-10	91	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-7-N10-13	94	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-7N13-16	97	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-7N16-17	100	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.544	0.328
1-7N17-24	103	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-7N24-28	106	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
1-8	109	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
2-1A2	112	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.848	0.563	0.344
2-1B2-MID	115	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
2-1B2N	118	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
2-1B2S	121	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
3-1B	124	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
3-1C	127	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.327
4-1N	130	21.294	0.003	0.004	0.041	0.117	0.187	1.000	1.000	0.999	0.926	0.611	0.363
4-1S	133	21.294	0.003	0.004	0.041	0.117	0.187	1.000	1.000	0.999	0.926	0.611	0.363
4-2	136	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
4-2A	139	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
4-2B	142	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
4-2C	145	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
4-7	148	22.587	0.003	0.004	0.039	0.113	0.182	1.000	1.000	1.000	0.946	0.627	0.311
4MGT	151	21.294	0.003	0.004	0.041	0.117	0.187	1.000	1.000	0.999	0.926	0.611	0.363
5-1A	154	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
5-1B	157	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
6-1B1	160	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
6-1B1-B	163	6	0.244	0.235	0.931	1.000	1.000	0.062	0.000	0.000	0.000	0.000	0.000
8-1N	166	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.887	0.629	0.417
8-1N-B	169	4	0.861	0.859	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
8-1S-B	175	4	0.861	0.858	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
8-2C	178	16.903	0.004	0.005	0.051	0.145	0.230	1.000	1.000	0.994	0.861	0.526	0.308
8-2D	181	16.903	0.004	0.005	0.051	0.145	0.230	1.000	1.000	0.994	0.860	0.525	0.308

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
9-1AE	184	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
9-1AMID	187	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
9-1AW	190	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
9-1BE	193	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
9-1BMIDE	196	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
9-1BMIDW	199	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
9-1BW	202	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
A1	205	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
B1	208	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
BB1	211	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BB2	214	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.561	0.343
BB3	217	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
BB4	220	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
BB5	223	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BB6	226	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
BB7	229	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
BB8-B	235	4.031	0.529	0.529	0.999	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BD1	238	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BDL0	241	16.903	0.004	0.005	0.051	0.145	0.230	1.000	1.000	0.994	0.860	0.525	0.308
BDL1	244	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BDL2	247	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BDL3	250	16.903	0.004	0.005	0.051	0.145	0.230	1.000	1.000	0.994	0.860	0.525	0.308
BDL4	253	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.887	0.629	0.417
BDL4-B	256	3.312	0.986	0.981	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BDL5	259	16.903	0.004	0.005	0.051	0.145	0.230	1.000	1.000	0.994	0.860	0.525	0.308
BGC0	262	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
BGC1	265	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
BGC2	268	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
BGC3	271	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
BGC4	274	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
BL1	277	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
BL2	280	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
BL3	283	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
BL4	286	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
BL5	289	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BL6	292	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
BL7	295	21.761	0.004	0.006	0.056	0.158	0.250	1.000	1.000	0.991	0.856	0.470	0.203
BL89	298	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
BPC1	301	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
BPC2	304	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
BPC3	307	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
BPC4	310	19.623	0.003	0.004	0.042	0.121	0.193	1.000	1.000	0.998	0.918	0.602	0.352
BPC5	313	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
BPC5-B	316	2.617	0.998	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT1	319	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
BT10	322	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BT2	325	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
BT3	328	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
BT4	331	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
BT4-SA	334	21.294	0.003	0.004	0.041	0.117	0.187	1.000	1.000	0.999	0.926	0.611	0.363
BT5	337	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
BT5-B	340	3.293	0.999	0.997	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BT6	343	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BT6A	346	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BT7	349	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BT8	352	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
BT9	355	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
C1	358	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
C1-LF	361	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
CC1	364	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-01	367	21.294	0.003	0.004	0.041	0.117	0.187	1.000	1.000	0.999	0.926	0.611	0.363
D-06	370	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
D10	373	17.971	0.004	0.005	0.052	0.149	0.236	1.000	1.000	0.991	0.845	0.540	0.280
D-16N	376	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-16S	379	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-1732	382	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D1A	385	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D1B	388	16.549	0.003	0.005	0.050	0.143	0.226	1.000	1.000	0.993	0.839	0.583	0.352
D1b-LF	391	16.549	0.003	0.005	0.050	0.143	0.226	1.000	1.000	0.993	0.839	0.583	0.354
D1C	394	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D1c-LF1	397	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D1c-LF2	400	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D1c-LF3	403	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-25	406	21.294	0.003	0.004	0.041	0.117	0.187	1.000	1.000	0.999	0.926	0.611	0.363
D-25-B	409	7	0.287	0.279	0.962	1.000	1.000	0.014	0.000	0.000	0.000	0.000	0.000
D-26	412	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-28	415	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-29	418	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-30	421	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-31	424	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-34N	427	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-34S	430	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-35	433	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-36	436	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
D-37	439	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
D-38	442	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-39-1	445	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-39-2	448	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-39-3	451	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-42	454	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-43	457	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.887	0.629	0.417
D-44	460	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-45	463	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-48	466	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-49	469	16.549	0.003	0.005	0.050	0.143	0.226	1.000	1.000	0.993	0.839	0.583	0.352
D-50	472	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-51	475	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
D-53	478	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
D-56	481	21.829	0.002	0.003	0.033	0.095	0.153	1.000	1.000	1.000	0.953	0.701	0.475
D-60	484	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
D-61	487	21.294	0.003	0.004	0.041	0.117	0.187	1.000	1.000	0.999	0.926	0.611	0.363
D-61-B	490	6	0.505	0.503	0.999	1.000	1.000	0.003	0.000	0.000	0.000	0.000	0.000
D-62-B	496	6	0.505	0.502	0.999	1.000	1.000	0.003	0.000	0.000	0.000	0.000	0.000
D-64	499	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
E1	502	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
E1-LF	505	16.549	0.003	0.005	0.050	0.142	0.225	1.000	1.000	0.993	0.840	0.584	0.354
E1-LF-B	508	4.054	0.516	0.515	0.999	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
E2	511	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
E2-B	514	2.324	0.994	0.989	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
E2-LF	517	16.549	0.003	0.005	0.050	0.142	0.226	1.000	1.000	0.993	0.839	0.584	0.355
E2-LF-B	520	5.4	0.321	0.315	0.977	1.000	1.000	0.032	0.000	0.000	0.000	0.000	0.000
FC	523	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.886	0.629	0.417
GW10	526	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
GW11	529	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
GW12	532	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
GW13	535	22.587	0.003	0.004	0.039	0.113	0.182	1.000	1.000	1.000	0.946	0.627	0.311
GW14	538	22.587	0.003	0.004	0.039	0.113	0.182	1.000	1.000	0.999	0.946	0.628	0.311
GW14-1	541	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
GW15	544	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
GW16	547	16.157	0.003	0.005	0.051	0.147	0.232	1.000	1.000	0.975	0.847	0.561	0.343

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
GW17	550	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.886	0.629	0.417
GW18	553	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
GW18-B	556	5	0.183	0.179	0.861	0.997	1.000	0.032	0.001	0.000	0.000	0.000	0.000
GW2	559	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
GW3	562	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
GW4	565	21.761	0.004	0.006	0.055	0.156	0.247	1.000	1.000	0.991	0.856	0.472	0.204
GW5	568	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
GW6	571	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
GW7	574	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.852	0.467	0.202
GW8	577	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.852	0.467	0.202
GW9	580	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
HC1	583	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
HC2	586	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
HC3	589	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
HC4	592	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
HNC0	595	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.887	0.629	0.417
HNC1	598	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.887	0.629	0.417
HNC10	601	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
HNC10-B	604	2.369	0.997	0.993	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC2	607	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.886	0.628	0.416

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
HNC3	610	18.496	0.003	0.004	0.043	0.123	0.196	1.000	1.000	0.996	0.886	0.628	0.416
HNC4	613	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
HNC5	616	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
HNC6	619	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.327
HNC7	622	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.328
HNC8	625	16.965	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.988	0.834	0.543	0.327
HNC9	628	17.971	0.004	0.005	0.053	0.150	0.237	1.000	1.000	0.991	0.844	0.539	0.278
HNC9-B	631	2.52	0.992	0.986	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
HNC9-E	634	17.971	0.004	0.005	0.052	0.149	0.236	1.000	1.000	0.991	0.845	0.541	0.281
HNC9-W	637	17.971	0.004	0.005	0.052	0.149	0.236	1.000	1.000	0.991	0.845	0.541	0.280
LB1	640	19.623	0.003	0.004	0.043	0.125	0.199	1.000	1.000	0.998	0.916	0.599	0.352
LB2	643	19.623	0.003	0.004	0.042	0.121	0.193	1.000	1.000	0.998	0.918	0.602	0.352
LB3	646	19.623	0.003	0.004	0.042	0.121	0.193	1.000	1.000	0.998	0.918	0.601	0.350
LB4	649	19.623	0.003	0.004	0.042	0.120	0.193	1.000	1.000	0.998	0.919	0.603	0.352
LB5	652	19.623	0.003	0.004	0.042	0.121	0.193	1.000	1.000	0.998	0.918	0.602	0.352
LBB2	655	16.157	0.003	0.005	0.051	0.147	0.232	1.000	1.000	0.975	0.847	0.561	0.343
LBB3	658	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
LBB4	661	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
LBB5	664	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
LBB6	667	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
LBC1	670	21.294	0.003	0.004	0.041	0.117	0.188	1.000	1.000	0.999	0.926	0.609	0.360
LBC2	673	21.294	0.003	0.004	0.041	0.117	0.188	1.000	1.000	0.999	0.926	0.609	0.360
LF1	676	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
LF2	679	21.761	0.004	0.006	0.055	0.156	0.246	1.000	1.000	0.991	0.857	0.472	0.204
LF-GB	682	21.761	0.004	0.006	0.055	0.157	0.248	1.000	1.000	0.991	0.856	0.472	0.204
LL1	685	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203
LL2	688	21.761	0.004	0.006	0.056	0.159	0.250	1.000	1.000	0.990	0.855	0.473	0.207
LL3	691	21.761	0.004	0.006	0.055	0.157	0.248	1.000	1.000	0.991	0.855	0.469	0.202
MC1	694	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
OB1	697	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
OB2	700	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
OB3	703	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
OB4	706	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
PAC1	709	22.587	0.003	0.004	0.039	0.113	0.182	1.000	1.000	1.000	0.946	0.627	0.311
SL1	712	22.587	0.003	0.004	0.039	0.113	0.182	1.000	1.000	1.000	0.946	0.627	0.311
SL2	715	22.587	0.003	0.004	0.039	0.113	0.182	1.000	1.000	1.000	0.946	0.627	0.311
SL3	718	22.587	0.003	0.004	0.039	0.113	0.182	1.000	1.000	0.999	0.946	0.628	0.311
TS1	721	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS10	724	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
TS11	727	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
TS12	730	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS13	733	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
TS14	736	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS15	739	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS16	742	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS17	745	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS18	748	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS19	751	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.974	0.847	0.561	0.343
TS2	754	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS20	757	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS21	760	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.852	0.467	0.202
TS22	763	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
TS3	766	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS4	769	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS5	772	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS6	775	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS7	778	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
TS9	781	16.157	0.003	0.005	0.051	0.146	0.232	1.000	1.000	0.975	0.847	0.562	0.343
US1	784	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
GW11-B	787	2	0.998	0.996	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 29 (continued)
Morganza to the Gulf Economic Update
Project Performance by Study Area Reach for HEC-FDA Categories

2085 With Project													
Reach	Station	Target Stage	Target Stage Annual Exceedance Probability		Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
			Median	Expected	10	30	50	0.10	0.04	0.02	0.01	0.00	0.00
E1-B	790	4.877	0.193	0.188	0.876	0.998	1.000	0.046	0.000	0.000	0.000	0.000	0.000
BB7-B	793	3.56	0.770	0.768	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BD1-B	796	4.31	0.648	0.647	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
BC	799	19.623	0.003	0.004	0.042	0.121	0.193	1.000	1.000	0.998	0.917	0.599	0.349
L2L-A	802	21.761	0.004	0.006	0.055	0.157	0.247	1.000	1.000	0.991	0.856	0.470	0.203
L2L-B	805	21.761	0.004	0.006	0.056	0.158	0.249	1.000	1.000	0.991	0.856	0.470	0.203