



# GALVESTON BAY FOUNDATION

February 8, 2019

U.S. Army Corps of Engineers, Galveston District  
Attn: Ms. Jennifer Morgan, Environmental Compliance Branch  
Regional Planning & Environment Center  
P.O. Box 1229  
Galveston, Texas 77553-1229

Re: Coastal Texas Protection & Restoration Feasibility Study DIFR-EIS

Dear Ms. Morgan,

The Galveston Bay Foundation (GBF), a 501(c)(3) organization founded in 1987 whose mission is to preserve and enhance Galveston Bay as a healthy and productive place for generations to come, provides the following comments on the Coastal Texas Protection and Restoration Feasibility Study (Coastal Texas Study) Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR-EIS) to the U.S. Army Corps of Engineers (Corps). In this letter, we are limiting our comments to the Coastal Texas Study Upper Texas Coast planning area counties of Brazoria, Chambers, Galveston and Harris.

Hurricane Ike generated a large storm surge and was catastrophic for many who live or work near Galveston Bay, and GBF acknowledges that future storms could be even bigger and inflict even more damage. The vulnerability of the petrochemical industry along the Houston Ship Channel to a large storm surge raises both economic and environmental concerns. GBF agrees that steps need to be taken to protect these critical industrial facilities and Galveston Bay from an environmental catastrophe that could result from the release and spills of large amounts of petroleum and petrochemicals to adjacent waterways due to storm surge.

However, the placement of large coastal storm risk management (CSRM) structures could have profound and permanent effects on the ecological health of Galveston Bay and its continued status as one of the most productive estuaries in the nation. It is therefore essential for the Corps to fully evaluate the potential impacts to Galveston Bay from any proposed structure and ensure we have mitigated those impacts to the fullest extent.

After reviewing the Coastal Texas Study documents, we recognize the tremendous amount of work that has gone into preparing them and thank the Corps for their efforts thus far. However, we do not believe that the Corps has met National Environmental Policy Act (NEPA) EIS requirements for (1) a full and fair discussion of significant environmental impacts nor (2) has it informed decision makers and the public of reasonable alternatives which would avoid or minimize adverse impacts. We base this statement on our review of the DIFR-EIS:

1. There is uncertainty in the Tentatively Selected Plan (TSP) levee/floodwall alignment and the types of Bolivar Roads environmental gate structures to be utilized.
2. Related to item 1, the cost-benefit analysis is based on the TSP with an alignment that the Corps has indicated may change and environmental gate structures that may change. Should the realignment or gate structures change to a significant degree, stakeholders and the public will not have an adequate opportunity to review and comment on the revised cost-benefit figures unless those changes are re-posted on public notice.
3. The list of protected lands is not complete, including those owned and operated by GBF and fellow non-governmental organizations (NGOs).
4. The Corps has not provided an adequate analysis of the impacts to water quality and of the direct and indirect environmental impacts to habitat and the ecologically and economically critical living species of Galveston Bay, most notably to its oysters, fish, shrimp and crab species. The Corps has not provided an adequate cumulative impacts assessment. Nor has the Corps provided detailed mitigation strategies including appropriate adaptive management for any of these impacts to habitat or living species.
5. The Corps did not appear to adequately develop or assess a stand-alone nonstructural storm surge risk reduction alternative.
6. The Corps did not study an alternative that utilizes new or improved levees on the Houston Ship Channel that could prevent storm surge impacts to channel industrial plants'/plant complex's petroleum or petrochemical storage tanks.
7. We believe that the Corps incorrectly screened out the Severe Storm Prediction, Education and Evacuation from Disasters Center (SSPEED) Mid-Bay management measure (G-3-SSPEED) in Step 1 of the Planning Objective Screening Process.

For these reasons, GBF cannot support the currently proposed structural CSRSM alternatives at this time.

We note the finding that “The broad dissemination of information mandated by NEPA permits the public and other government agencies to react to the effects of a proposed action at a meaningful time.” *Marsh v. Oregon Nat. Res. Council*, 490 U.S. 360, 371 (1989). We are concerned that if the substantive deficiencies related to various aspects of the DIFR-EIS are not corrected until, and released with, the Final Integrated Feasibility Report and Environmental Impact Statement (FIFR-EIS), then the public will have insufficient time and opportunity to provide meaningful feedback to the Corps.

Therefore, GBF respectfully requests that the Corps complete a Supplemental DIFR-EIS that addresses the items above, most notably an adequate analysis of environmental and cumulative impacts, for public review and comment. The Supplemental DIFR-EIS should provide more certainty in the alternatives/alignments to be considered; all such alternatives should include a

complete cost-benefit analysis and a complete list of protected lands that may be directly or indirectly impacted.

The Corps should include in the Supplemental DIFR-EIS an adequate study of a non-structural based alternative to protect people and structures as well as an alternative that focuses on protecting industrial plant storage tanks, as noted in items 5 and 6 above, both of which could be utilized in conjunction with other alternatives whether they be structural or non-structural.

The SSPEED Mid-Bay management measure should be examined again in the Supplemental DIFR-EIS, ensuring that it has been properly screened in Step 1 of the Corps screening process against plan objectives.

For any new alternatives considered in a Supplemental DIFR-EIS, impacts to environmental justice communities must be assessed and addressed adequately.

The Corps must clarify whether or not the permitting and environmental review of this project is being or will ever be conducted under the “One Federal Decision” Executive Order 13807. Based upon GBF’s review to date, it appears that the Corps has not implemented EO 13807 in this project. GBF strongly agrees that the DIFR-DEIS and all subsequent NEPA review and permitting should not be subject to EO 13807. The Corps must also clarify its planning process that led up to the DIFR-EIS, and will eventually lead to a FIFR-EIS. For example, to the public, a Draft Integrated Feasibility Report with a “Tentatively Selected Plan” does not sound like a final federal action. This perception is reinforced by the fact that the design stage has barely begun, proposed detailed routing and locations of structures are nowhere in the DIFR-DEIS, and the DIFR-DEIS lacks the typical maps and design pictures normally found in NEPA documents—Appendix D only includes figures of “typical” structures. We request that the Corps clarify that after the completion of the FIFR-DEIS, the 2-3-year design phase will be subject to full NEPA disclosure through an EIS and with the opportunity for full public participation.

The Corps should allow at least 120 days for public review of the Supplemental DIFR-EIS and once again conduct public meetings to best inform the public of the TSP alignment and environmental impacts. We believe that a formal question/answer session, in addition to the public comment session, would be beneficial to those in attendance at future public meetings. In it, questions that are asked and the answers provided by the Corps could be heard by all. This could supplement the open house portion of the public meeting. At these meetings, we recommend more time than 1 minute for individuals to provide public comments.

GBF is in strong agreement with the statement on page xxii of the Executive Summary that gate structures should not be installed at San Luis Pass, given that the “anticipated risk reduction benefits do not outweigh the potential negative impacts” to the “last remaining natural pass along the Texas coast” and its proximity to valuable habitats in West Bay and Christmas Bay, including remaining stands of seagrasses. That said we believe that the Corps must conduct a better assessment of the indirect impacts of the TSP to San Luis Pass and local environs from induced wave action from storms and increased storm surge volumes that would otherwise have been allowed to flow over the west end of Galveston Island. Previous storm protection proposals included a surge gate at San Luis Pass, therefore it is possible that the Corps may receive public

comments suggesting such a gate be added to the TSP. Any proposal to add a gate or structure at San Luis Pass would constitute a major change and therefore require a Supplemental DIFR-EIS.

GBF does support the ecosystem restoration components of the Upper Texas Coast Tentatively Selected Plan. However, we would like to see the expanded use of oyster reef creation/restoration, beach/dune nourishment, and where appropriate the expanded use of wetland creation/restoration as both a standalone measure and as a major component of a new non-structural alternative for storm surge risk reduction. This should include analysis of methods to reverse the man-made reduction of the transport of sediment and sand to and within the Upper Texas Coastal region caused by the construction of dams, jetties, groins and dikes. The Corps should also explore the use of creative, market-based land protection tools, e.g. Lone Star Coastal National Recreation Area and SSPEED's Texas Coastal Exchange.

GBF believes that the protection of industry has driven much of the impetus for coastal storm surge protection, which is justified given the importance of the Upper Texas Coast petrochemical industry. However, the Corps/Texas General Land Office (TGLO) Coastal Texas Study does not investigate and analyze the storm surge protections that these industries could provide on their own or with government funding assistance, which could possibly serve as an adequate line of defense against damages to the facilities and the release of petroleum and petrochemicals. By contrast, GBF notes that existing fortified levee/wall in Brazoria, Orange and Jefferson counties (the "bookends") and recommended enhancements of same are a significant element in the *Sabine Pass to Galveston Bay Coastal Storm Risk Management and Ecosystem Restoration* DIFR-EIS TSP. GBF believes that any study that addresses the protection of Houston Ship Channel (HSC) industry must include the true investigation and analysis of the ability of new and/or improved levees on the north and south banks of the HSC to afford such protection.

The remainder of this letter provides in-depth discussion of our above-noted observations, concerns, and recommendations.

### 1. Uncertainty in the TSP

There appears to be much uncertainty in the TSP. In Section 4.3.4.4, the Corps writes, "For planning purposes, the team has evaluated a levee/floodwall system across Bolivar Peninsula and Galveston Island; however, the team recognizes that there are opportunities to optimize the design and alignment to minimize impacts to existing structures and the environment on the peninsula and island. Future design efforts would focus on where engineered dune systems may be appropriate versus levees and floodwalls." In Section 4.3.4 the Corps writes, "Once a strategy for risk reduction has been selected, the study team will focus on the scale of the level of risk reduction for the TSP in future planning and design phases. Individual features such as levee heights, flood heights, pump station sizes, and nonstructural features will be optimized.

The Corps stated in the four Upper Texas Coast public meetings held in December 2018 that the alignment has not yet been selected and the design is only 10% complete, yet the public is required to comment on the alignment and gate structures without knowing the location or design of the levee/floodwall or the certainty the type of environmental gates that will be utilized. Additionally, we have heard that elected officials, including Texas General Land Office Commissioner George P. Bush, have serious reservations about the placement of the Galveston Ring Levee component.

Due to this uncertainty in the Tentatively Selected Plan (TSP) levee/floodwall alignment and Bolivar Roads environmental gate structures that may be employed, we believe that the Coastal Texas Study does not provide the public the necessary level of detail to provide informed comments.

This is unacceptable to organizations such as ours which are trying to determine the direct and indirect environmental impacts to Galveston Bay or the Gulf shoreline. Home and business owners, as well as land owners such as GBF and other non-governmental organizations (NGOs) that manage lands protected for their habitat and water quality functions, need this information to make informed comments about impacts to their assets. For example, GBF owns the 449-acre Sweetwater Preserve on Galveston Island, which may be in or very near the path of the Galveston Ring Levee; we should be afforded the opportunity to know what impacts this structure may have on our property's habitat, water quality and the animals which are permanent or seasonal residents.

## 2. Uncertainty in the Cost-Benefit Analysis

The uncertainty in the alignments and the gate components also leads to our concern that the cost-benefit analysis is not reflective of what will be ultimately proposed. For example, the Corps indicates that it is still considering a wet beach dune-levee system alignment in lieu of an earthen levee/floodwall system "across" Bolivar Peninsula and Galveston Island. The Corps also indicates that the environmental gates could be in the form of lift gates that are currently widely in use, Thames Barrier rotating gates, or piston-hinge gates such as are found in Lido, Venice, Italy.

Based on the response from the U.S. Fish and Wildlife Department Freedom of Information Act (FOIA) request of January 24, 2018, the response from the Corps to the Gulf Restoration Network (GRN) FOIA request of February 23, 2018, and the detailed analysis of direct impacts to jurisdictional wetlands (down to the tenth of an acre) in the DIFR-EIS, we believe that the cost-benefit analysis is based on the alignment across specific land parcels that are shown on the Google map created by GRN (<https://bit.ly/galvmap>) which was developed using the information and shape files received from the agencies. The costs to construct and maintain such an earthen levee/floodwall system placed north of Hwy. 87 on Bolivar Peninsula and FM 3005 on Galveston Island will vary greatly from a dune-levee system constructed on a wet beach, as will the costs to mitigate for direct impacts to jurisdictional wetlands in the footprint of the system alignment. Therefore, we believe the TSP benefit-cost ratio (BCR) has been based on the placement of earthen levee and floodwalls as shown in the FOIA request, and that it will change greatly if the dune-levee system replaces it as the TSP.

Likewise, the costs for the TSP gate structures are already highly variable, as is noted in Section 6.7.1 where the Corps states that, "The greatest ranges in estimated costs are associated with design and construction of the 1,200-foot gate complex and floodwall construction along the backside of Galveston. The range for gate design and construction is relatively wide to account for variability in fabrication and transportation estimates." We also note that placement of structures that may increase suspension of sediments, especially in areas where there may be contaminant or bacterial concerns, would also impact the BCR. Adding in this uncertainty of the final type of environmental gates, and perhaps even the type of navigation gates, renders the current BCR circumspect.

To further add to the uncertainty in the cost-benefit analysis, the removal of the Galveston Ring levee would decrease the construction and maintenance costs, and could potentially reduce storm surge damage reductions benefits of the overall TSP. This may greatly alter the current BCR.

Given the fact that components of the TSP, such as the Galveston Ring Levee and San Luis Pass gate may or may not be removed from, or added to, subsequent iterations, we believe that the Corps should provide cost-benefit analyses on the various components so that the public has a clearer picture of the net benefit or loss of each. The same is true for the cost-benefit analysis of the type and location of gate structures and type and location of levee systems; the Corps should provide the BCR for the different types of gate structures and levee structures that are being contemplated as options.

Finally, in evaluating any alternatives' benefits and costs the Corps must consider the future long-term effectiveness of each. On page 1-13 of the main report, the Corps writes, "The PDT developed planning objectives to apply to the entire study area over the 50-year planning horizon (2035–2085). However, on page 2-19 in Appendix D, the Corps writes, "The climate for which the project was designed can change over the full lifetime of a project to the extent that stability, maintenance, and operations may be impacted, possibly with serious consequences, but also potentially with beneficial consequences. Given these factors, the project planning horizon (not to be confused with the economic POA) should be 100 years, consistent with Engineer Regulation 1110-2-8159." GBF agrees that given rapidly changing climatic conditions and their effect on the coastal area, including sea level rise, we believe that the planning horizon should be 100 years rather than 50 years, extending to the Year 2135.

### 3. Incomplete List of Protected Lands

Land that GBF and other NGOs owns and operates lands in the Upper Texas Coast study area, e.g. our 449-acre Sweetwater Preserve, which may be in or adjacent to levee alignments, are not included in Section 2.0, Table 2-8. We note that Houston Audubon Society sanctuaries on Bolivar Peninsula and Artist Boat Coastal Heritage Preserve on Galveston Island are also not included. The uncertainty in the alignment exacerbates this issue, as was noted above. Landowners, both NGOs and private, need this information so they can make informed comments, and the list of Protected Lands which may be impacted must be complete.

### 4. Incomplete Analysis of Direct and Indirect Environmental Impacts, Cumulative Impacts, and Mitigation Strategies

In addition to the inherent problems of the nebulous nature of the TSP noted above, we believe there are unacceptable deficiencies with the assessment of its environmental consequences. We do believe that the Corps has provided an adequate modeled analysis of the physical and hydrological impacts to Galveston Bay (changes to tidal volume, tidal amplitude and tidal velocity) that would result from the construction of the TSP gate structures that have been presented for planning purposes (the vertical lift gate design and configuration per DIFR-EIS Main Report Section 4.0 and Appendix D), as well as the modeled indirect impacts to coastal wetlands due to the decrease in tidal amplitude.

Despite this comment, the DEIS sections on estuarine modeling, salinity and hydrology (e.g. DEIS Sections 5.2, 5.3.5, and Appendix D Section 2) are not clear with respect to whether the Adaptive

Hydraulic model was run with the existing depth/width of the ship channel in Galveston Bay, or the depth/width of the proposed and reasonably foreseeable deepened ship channel. The Corps published the DIFR-DEIS for the Houston Ship Channel Expansion Project in August 2017, and these two Corps projects should be evaluated for NEPA impact purposes in recognition that each project is a reasonably foreseeable for the other for the purposes of cumulative impacts. See 40 C.F.R. § 1508.7.

However, the Corps has not provided an adequate analysis of the impacts to the environment from the potential increase to toxins in the Bay's sediments owing to the increased water residence time. In Section 5.3.4.1, the Corps notes that, "The Coastal Barrier is expected to affect water and sediment quality throughout the Galveston Bay system, because it would reduce flushing and mixing of point and nonpoint source pollutants entering the bay." As a result, water retention times will increase, dissolved oxygen can be reduced, fish kills can occur and algae blooms can result.

Additionally, the Bay is currently not meeting its designated uses for oyster harvest due to elevated bacteria levels, resulting in a total maximum daily load (TMDL) throughout the Bay and there are fish consumption advisories due to the presence of dioxins and polychlorinated biphenyls stemming from levels of these toxicants in the sediments. In the case of the former, it is not evident from the DEIS that the Corps is engaging with the Texas Commission on Environmental Quality on the impacts from this TSP on the TMDL. In the case of the latter, GBF has concerns that fish consumption advisories could be exacerbated and requests that the Corps engage with the Texas Department of State Health Services on the potential impacts.

Contrary to what is written on page xi of the Executive Summary ("Where impacts could not be avoided, impacts were quantified, and a mitigation plan was formulated"), we do not believe that the Corps has provided an adequate analysis of the direct and indirect environmental consequences to the ecologically and economically critical living species of Galveston Bay, most notably to its oysters, fish, shrimp and crab species. The same holds true for species which depend on functioning Gulf beach/dune habitats such as the endangered Kemp's ridley sea turtle, Green sea turtle, Loggerhead sea turtle and Piping plover.

We are concerned for the TSP impacts on Galveston Bay's dolphin populations. Galveston Bay Foundation has endeavored to develop a dolphin research and conservation program to protect these important and charismatic marine mammals. It is very troubling that the DEIS can only speak the "potential to hinder dolphin movements in and out of the inlet" and that "functional passage may be restricted to the Houston Ship Channel surge barrier gate where there is the potential for vessel traffic impacts." It is further troubling that the DEIS acknowledges that "Dolphin habitat use and health in these zones could be affected by even a small decrease in salinity under project conditions." The Corps must obtain the information needed to better understand these impacts.

We find it disappointing that ten years have elapsed since Hurricane Ike struck the Upper Texas Coast and the first of the coastal barrier concepts were proposed. However, in the intervening time, no rigorous scientific studies have been conducted on the potential effects of the gate structures on the biota of Galveston Bay. While we understand that the Corps is not necessarily responsible for performing these studies, the lack of local studies and data on fish larval transport does not allow the Corps to ascertain the impacts from the gate structures changes to tidal parameters on the Bay's

fish, shrimp and crab populations. We believe that studies should be conducted as soon as possible so that an appropriate impacts and mitigation plan can be prepared. We believe these studies should be conducted during and after construction as part of the long-term maintenance plan to determine any long-term impacts.

We also find it telling that the only reference to the Netherlands experience or to Netherlands researchers that we could find in the entire DIFR-EIS was that of M. Ruijs 2011 master's thesis on two-dimensional modeling of potential effects of "Ike Dike" storm surge barriers on hydrodynamics and implications for water quality and Bay morphology. No doubt this work is invaluable, as it points out the potential impacts to habitats. We note that one of Ruijs' findings is that "*The effects of the changing hydrodynamics, water quality and morphology on the ecology should further be investigated by an ecologist. It should be investigated what the effects are on the habitats and its flora and fauna.*" We wholeheartedly agree with this statement.

Given that the Corps is utilizing Dutch examples of structural alternatives and that Ike Dike proponents have stated that there have been no major ecological problems in the Netherlands, we believe that Dutch studies on impacts of their storm surge barriers (or the lack thereof) on the ecology and fisheries of would be contained in the cited literature. We believe the problem may be that there is a dearth of such studies on impacts to living species from Dutch Delta Works and we are being asked to simply trust that we will not experience losses of our critical Galveston Bay fisheries from similar structures built on the Upper Texas Coast. GBF does not find that acceptable.

We understand from communications with resource agency personnel that there is much variability in the use of different areas and depths in the passes during the movement of these various species in and out of the Bay during their life stages, both adult and juvenile forms as well as these species' eggs. This may account for much of lack of data on impacts and quantification of impacts, but it does not relieve the Corps from best determining these impacts and providing the information to the public.

Regarding the potential impact to Galveston Bay's critical oysters, we are very concerned that the DIFR-EIS understates the potential impacts to oysters. While we believe that the Corps has adequately modeled the changes to absolute salinity concentrations and reports that the absolute change will be an average decrease of 2 parts per thousand, that does not answer the question of the continued health of the oysters during floods and droughts when oysters are at their most vulnerable.

In Section 5.3.2.2.1, the Corps writes, "The reduced circulation that is expected would increase residence time in the bay upstream of the Coastal Barrier and allow greater dilution by freshwater inflows. During periods of normal to relatively high freshwater inflow ("wet" periods), the model predicts salinity from surface to bottom would be lower and remain lower for a longer time." In that same section, the Corps also writes that, "During periods of severe drought, with low freshwater inflow and high evaporation or when storms push saline water into the bay upstream of the barrier, saline water remains in the bay above the barrier for longer periods, and salinities would be higher than without the barrier in place."

Given the critical nature of oysters in Galveston Bay as a keystone species, we believe it is

mandatory that the Corps provide detailed information as to the potential magnitude and duration of these high freshwater inflow and drought conditions, using data from modeled events supplemented with data from the many historical events that have occurred in Galveston Bay over the past decades. Given the projected climate change scenarios, the instance of these extreme events will only increase, placing Galveston Bay's oysters in even more peril due to the effect of the gate constriction at Bolivar Roads on salinity changes.

Additionally, in regard to potential impacts on oysters we are concerned that increased deposition of sediment in the interior portions of the Bay may impact oyster filter feeding and the health of the reefs. Based on Ruijs 2011 modeling study, we believe that the TSP can be expected to decrease current velocities in the main part of the Bay, which could lead increased deposition of sediment on oyster reefs. We are concerned that this could impact the health of the oysters and believe that this must be studied. This is especially critical given the current imperiled condition of the reefs, the continued fishing pressure on them including the changes reef morphology from natural relief from the mud line to the flattened nature that results from harvest activities.

We note the following passage from the Executive Summary, page xxi provides a flavor of the uncertainty in the impacts to living species (emphasis added):

“Preliminary studies conducted by the USACE show that the surge barrier gates proposed as features of the Coastal Barrier Alternative may affect wetland functions by constricting tidal exchange and the associated sediment transport and altering hydrosalinity gradients. This, in turn, **could potentially impact the ecology** of the Galveston Bay estuary **and the fish, birds, and wildlife species** that depend on the resources provided by wetland and marsh habitats. Steps would be taken to avoid, minimize, and reduce any potential impacts to the best extent practicable. Additionally, estuarine modeling conducted by the USACE shows that construction of the surge barrier gates could reduce flow into and out of Galveston Bay and increase velocities along the opening of the gates during specific times. These effects **could have long-term impacts on estuarine habitats and fauna** within the bay.”

In Section 5.4.2.2.1 concerning fisheries impacts, the Corps writes (emphasis added), “The predicted reduced flow and increased velocities through Bolivar Roads **could impede the migrations and movements of various life stages of fish into and out of the Galveston Bay system.**” However, this statement and a single paragraph in Appendix C-1 is the extent of the discussion on potential TSP impacts to migrations and movements. As we noted above, we find the lack of studies on local species to be inadequate and troubling. GBF must have this critical information, as it our main concern with the TSP is the effects on the fisheries of Galveston Bay. The absence of this information, more than anything else, renders the DEIS incomplete.

Further, the only mitigation that is described in detail is for the direct and indirect impacts to jurisdictional wetlands. We believe that the Corps has properly modeled wetlands impacts resulting from direct construction impacts and the losses of intertidal areas and has accounted for the costs to mitigate for these impacts. However, the Corps has not addressed the impacts to wetlands due to a reduction or cessation of sediment transport from the Gulf side of Bolivar

Peninsula and Galveston Island to the Bay side of each that will result from the placement of a fixed levee system. Such a structure will impact natural transport of sediment by aeolian forces and overwash events.

We are also concerned about induced erosion of the Gulf beaches/dunes and in Bolivar Roads and San Luis Pass. The Corps acknowledges these consequences of the building of a Coastal Barrier on page 5-6 of the main report:

“Erosion in these unprotected inlets, like San Luis Pass, is anticipated to increase due to the increase in velocity. During non-storm conditions, the increase in velocity within and near the inlets would cause additional localized scouring, particularly at the Bolivar Roads surge barrier gates... Storm surges piling against the barrier would impact erosion on Galveston Island. The beaches fronting the seawall currently experience a lack of natural sand nourishment during non-storm conditions, especially near the Bolivar Roads jetties, but would be exposed to greater surge and wave impacts during storms with the Coastal Barrier in place. Overwash and storm-induced sediment influx could be reduced with the coastal barrier in place. This could decrease the available sediment inside the bay system post-storm events, which would adversely impact the marsh sustainability on Bolivar Peninsula along the GIWW on the protected side of the Coastal Barrier...”

Such a result is in conflict with one of the key objectives of the study, namely “to restore and enhance the State’s ecologic coastal features.”

We suggest that it will be critical for the Corps to work with the resource agencies to ensure that any ensuing wetland mitigation plans do not impact or replace other critical habitats such as oyster reefs, seagrass meadows and mud flats.

The Corps has not provided any estimation of the potential losses to recreational and commercial fisheries’ species abundance or harvests resulting the direct or indirect impacts of the gate structures or losses of wetland habitat. Nor has the Corps addressed how such losses could possibly be mitigated. This is a major omission in the DEIS. This information needs to be developed and the resulting value of these losses needs to be included in the cost-benefit analyses of the current TSP or future iterations.

Further, we do not believe that the Corps has adequately analyzed cumulative environmental impacts of the TSP when added to past, present and reasonably foreseeable actions that have occurred, are occurring, or will likely occur in Brazoria, Chambers, Galveston and Harris counties. It appears that the Cumulative Impacts sections in both the Main Report and Appendix C-1 consist of a list of other actions and a very brief and general description of what *may* occur if the TSP is implemented. We believe that the Corps has done a good job listing the Corps navigation and flood control projects, the Corps and Federal and State resource agency-led restoration projects, and to a lesser extend the NGO-led restoration projects.

However, the only development project listed for our 4-county region is the Spoonbill Bay project on West Galveston Island. There appears to be no data on acreage or functional value analysis of

jurisdictional wetlands that have been impacted by the other countless Clean Water Act (CWA) Section 10 or Section 404 permitted actions nor data on the acreage or functional value of the mitigation performed as compensation per the CWA for these projects, whether they be for residential or commercial development, oil/gas exploration/production, shoreline armoring, docks, etc. As the administrator of these permits, we believe that the Corps should include this data in combination with the TSP's direct and indirect impacts on wetlands. That analysis should attempt to determine the total losses of wetlands and other jurisdictional Waters of the U.S. and better determine cumulative impacts that will result when added to the TSP impacts and for input into development of alternatives.

In addition to data on impacts from CWA Section 10 and Section 404 permit actions, the Corps has not provided analysis of water quality impacts from increased non-point source pollution due to increased impervious surfaces in the Lower Galveston Bay Watershed. This data would be needed to determine cumulative impacts to water quality parameters when added to the TSP impacts of reduced flushing/increased residence time of Bay water. The same can be said for an analysis of the cumulative impacts by analyzing the additive effects of increased Gulf shoreline and Bay shoreline erosion that will result from the TSP to the data on anticipated erosion and shoreline retreat.

Thus, without these data and analyses, GBF cannot concur with the Corps statement on page 5-122 of the Main Report that "Since the TSP is intended to provide long-term benefits to coastal resources, cumulative impacts that may result from the TSP are likely to be positive or beneficial." We do not think the Corps has provided a scientifically-based rationale for that statement. We are very concerned that with all of the environmental impacts of the TSP, the cumulative impacts may be negative and detrimental. The Corps needs to provide this information in the Supplemental DIFR-EIS.

Finally, in evaluating any alternatives' direct and indirect impacts to the environment the Corps must consider the future long-term effects of each. On page 1-13 of the main report, the Corps writes, "The PDT developed planning objectives to apply to the entire study area over the 50-year planning horizon (2035–2085)." However, on page 2-19 in Appendix D, the Corps writes,

"The climate for which the project was designed can change over the full lifetime of a project to the extent that stability, maintenance, and operations may be impacted, possibly with serious consequences, but also potentially with beneficial consequences. Given these factors, the project planning horizon (not to be confused with the economic POA) should be 100 years, consistent with Engineer Regulation 1110-2-8159."

GBF agrees that given rapidly changing climatic conditions and their effect on the coastal area, including sea level rise, we believe that the planning horizon should be 100 years rather than 50 years, extending to the Year 2135. This same planning horizon end date of 2135 should be applied to the cumulative impacts as well.

##### 5. Incorrect Development and Assessment of a Stand-Alone Non-Structural Alternative

The Corps did not adequately develop and assess a stand-alone nonstructural storm surge risk

reduction alternative. In Section 4.0, the Corps provides only anecdotal information on the likelihood of owners of 64,000 structures receiving damage from a 0.01 annual chance agreeing to voluntary buyouts, rather than investigating the likelihood of owners agreeing a combination of voluntary buyouts or elevation of structures. The Corps assumes that the owners of these 64,000 structures will not agree to buyouts, on which we agree.

However, the Corps provides only this “either/or” option in regard to nonstructural alternative and provides no data on the risk reduction and cost of elevating some structures and buying out other structures that are in the worst of the storm surge zones. Given the \$15-20 billion estimated construction cost of the TSP structures, the \$100-130 million annual maintenance costs, and the potential economic losses due to damage to recreational and commercial fisheries and ecotourism-related industries, GBF believes it is incumbent upon the Corps to perform a robust cost-benefit analysis of the cost of elevating structures and buying out the higher flood risk structures.

Such an alternative could be implemented in conjunction with ecosystem restoration efforts and smaller scale structural solutions to provide a reasonable level of risk reduction and avoid the high direct environmental impacts and the potentially unacceptably high indirect environmental impacts/costs. This alternative could also be utilized in conjunction other non-structural solutions, e.g. flood proofing of structures, implementing flood warning systems, flood preparedness planning, establishment of land-use regulations, and development restrictions within the greatest flood hazard areas.

#### 6. Absence of Analysis of New or Improved Levee/Floodwalls to Protect Houston Ship Channel Industrial Facilities/Storage Tanks

The Corps did not study an alternative that utilizes new or improved levees on the Houston Ship Channel that could prevent storm surge impacts to channel industrial plants'/plant complex's petroleum or petrochemical storage tanks. The study is incomplete without such alternatives to the Corps' two structural solutions that were analyzed in detail.

GBF believes that the protection of industry has driven much of the impetus for coastal storm surge protection, which is justified given the importance of the Upper Texas Coast petrochemical industry. However, the Corps/Texas General Land Office (TGLO) Coastal Texas Study does not investigate and analyze the storm surge protections that these industries could provide on their own or with government funding assistance, which could possibly serve as an adequate line of defense against damages to the facilities and the release of petroleum and petrochemicals. This is an egregious oversight in our opinion. One only needs to look at the Texas City Hurricane Flood Protection Project (Texas City HFPP), which has provided adequate protection to Texas City industrial facilities from Hurricane Ike and prior storms. We note that the dock facilities of Texas City industry extend outside of the Texas City HFPP and we believe that the same type of system could potentially protect the HSC industry.

GBF believes that any study that addresses the protection of HSC industry must include the true investigation and analysis of the ability of new and/or improved levees on the north and south banks of the HSC to afford such protection. Given the highly impacted habitats in the HSC, the environmental costs for this protection would be low. We note that there is precedent for the Corps including existing structures/improving existing structures in the cost-benefit analysis. In the

*Sabine Pass to Galveston Bay Coastal Storm Risk Management and Ecosystem Restoration* DIFR-EIS, the USACE incorporated existing fortified levee/floodwall in Brazoria, Orange and Jefferson counties (the “bookends”) and recommended enhancements to them as a significant element in that TSP. GBF believes the Corps would be remiss by not including HSC structures in this much larger scale project.

#### 7. Incorrect Screening of SSPEED Mid-Bay Management Measure

Further compounding our concerns that the DIFR-EIS does not currently meet a standard necessary to allow for informed public comment, we believe that the study incorrectly screened out the Severe Storm Prediction, Education and Evacuation from Disasters Center (SSPEED) Mid-Bay management measure (G-3-SSPEED from Table 4-4 Initial Measure List) in Step 1 of the Screening Process. While we are not supporting any large structural plans at this time, and cannot do so until we are convinced that any such structures will not harm Galveston Bay to an unacceptable level, we believe that management measure G-3-SSPEED does meet all seven of the Corps’ CSRMP Planning Objectives as shown in Table 1-2 on page 1-13 of the main report and should have been included for further screening against the Planning Constraints.

We note that all other structural management measures did advance past Step 1, in particular the measures that were later developed into Alternatives C, D1 and D2. Those three measures are similar to the SSPEED management measure in that they protect the western shoreline of Galveston Bay. While we acknowledge that this management measure may not have advanced past Step 2 (avoiding planning constraints), the public is unable to review the discussion of the analyses that have been made available for all other structural management measures. The Corps should provide that documentation so that we can understand the reason for its omission.

#### Deficiencies in the DEIS and Need for Supplemental DIFR-EIS

Given our above comments on the DIFR-DEIS, we maintain the following regulations regarding the preparation of a DEIS have not been fulfilled:

##### **40 CFR 1502.1 Purpose**

“It (EIS) shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.”

“Statements shall be...supported by evidence that the agency has made the necessary environmental analyses.”

##### **40 CFR 1502.14 Alternatives including proposed action**

“In this section agencies shall:

- (a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
- (b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

- (c) Include reasonable alternatives not within the jurisdiction of the lead agency.
- (f) Include appropriate mitigation measures not already included in the proposed action or alternatives.”

#### **40 CFR 1502.16 Environmental consequences**

“This section forms the scientific and analytic basis for the comparisons under §1502.14. It shall consolidate the discussions of those elements required by sections 102(2)(C)(i), (ii), (iv), and (v) of NEPA which are within the scope of the statement and as much of section 102(2)(C)(iii) as is necessary to support the comparisons. The discussion will include the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented. It shall include discussions of:

- (a) Direct effects and their significance (§1508.8).
- (b) Indirect effects and their significance (§1508.8).
- (c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned. (See §1506.2(d).)
- (d) The environmental effects of alternatives including the proposed action. The comparisons under §1502.14 will be based on this discussion.
- (e) Energy requirements and conservation potential of various alternatives and mitigation measures.
- (f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.
- (g) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.
- (h) Means to mitigate adverse environmental impacts (if not fully covered under §1502.14(f)).”

#### **40 CFR 1502.22 Incomplete or unavailable information.**

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

- (a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.
- (b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are

exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

(1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

We note that in Section 4.0 concerning Formulation and Evaluation of Alternative Plans, it is stated,

"Once the report has undergone a public review, policy review, ATR, IEPR, and once the TSP has undergone further development under future planning and design phases, additional sections in the final report will be added to describe any additional planning efforts undertaken to account for comments received on the DIFR-EIS."

Given the further development that is anticipated, the uncertainties in the TSP, and the deficiencies noted above, GBF believes it is incumbent on the Corps to prepare a Supplemental DIFR-EIS as required by 40 CFR 1502.9 which states that agencies,

"(1) Shall prepare supplements to either draft or final environmental impact statements if:

(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."

### Summary

GBF cannot support the currently proposed structural CSRMs alternatives at this time. GBF requests that the Corps complete a Supplemental DIFR-EIS that addresses our comments, most notably an adequate analysis of environmental impacts and cumulative impacts. The DIFR-EIS should include the study of the feasibility of a non-structural/ecosystem restoration-based alternative as well as an alternative that focuses on protecting industrial plant facilities/storage tanks. The SSPEED Mid-Bay management measure should be examined again in the Supplemental DIFR-EIS, ensuring that it has been properly screened against plan objectives.

For any new alternatives considered in a Supplemental DIFR-EIS, impacts to environmental justice communities must be assessed and addressed adequately.

The Corps should allow at least 120 days for public review of the Supplemental DIFR-EIS and

once again conduct public meetings to best inform the public of the TSP alignment and environmental impacts. While we can appreciate the number of commenters wishing to speak at public meetings, we recommend more time than 1 minute for individuals to provide public comments. Some of the meetings ended early, so we think there may have been time for longer duration for individual comments.

For future public meetings, we recommend that the Corps provide a question/answer session prior to public comments in which questions that are posed and the answers provided by the Corps could be heard by all. This could supplement the open house portion of the public meeting, provide added value to these informational events, and perhaps decrease the number of individuals needing to provide comments if they are better informed of the proposals.

GBF is in strong agreement with the statement on page xxii of the Executive Summary that gate structures should not be installed at San Luis Pass

GBF would like to see the expanded use of oyster reef creation/restoration, beach/dune nourishment, and where appropriate the expanded use of wetland creation/restoration to decrease risk from storm surge impacts and increase coastal resiliency. We recommend the DIFR-EIS investigation into methods to reverse the man-made reduction of the transport of sediment and sand to and within the Upper Texas Coastal region caused by the construction of dams, jetties, groins and dikes.

Thank you for considering these comments. Please contact me at 281-332-3381 x209 or [sjones@galvbay.org](mailto:sjones@galvbay.org) should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott A. Jones". The signature is written in a cursive, slightly slanted style.

Scott A. Jones  
Director of Advocacy