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Sabine Neches Navigation Improvement Project Integrated Section 203 Feasibility Report and Environmental Assessment

Appendix I
Clean Water Act Section 404(b)(1) Evaluation

February 2026

1 Project Description

a. Location

The Sabine-Neches Waterway (SNWW) is located on the upper Texas Gulf Coast at the Texas-Louisiana state boundary located in Jefferson and Orange counties, Texas, and Cameron and Calcasieu parishes, Louisiana. The SNWW begins offshore, follows the west side of Sabine Lake, and terminates just upstream of the Beaumont Turning Basin on the Neches River. Ongoing construction of the SNWW deepening (the -48-foot channel deepening project) is proceeding within the federally authorized and maintained waterway. All subsequent references to the project location in this report focus on the proposed widening of three discontinuous lengths of inshore channels (see General Description below) within the approximately 77-mile-long authorized channel.

The project area for the proposed widening actions is defined as areas that could be directly affected (e.g., the proposed dredging footprint, construction equipment and material staging areas, existing upland placement areas [PAs], and areas within the Bessie Heights East Beneficial Use site established for the ongoing channel deepening). The study area includes a larger area for which environmental effects of alternatives were analyzed; the largest of these areas were utilized for hydrodynamic and water quality modeling. The study area encompasses approximately 3,200 square miles,[1] which contains the smaller project area, Sabine Lake and adjacent marshes in Texas and Louisiana, the Neches River Channel up to the new Neches River Saltwater Barrier, the Sabine River Channel to the Sabine Island Wildlife Management Area (WMA), the Gulf Intracoastal Waterway (GIWW) west to Star Bayou, the GIWW east to Gum Cove Ridge, the Gulf shoreline extending approximately 35 miles offshore into the Gulf. Details regarding the proposed widening features, construction assumptions, and material placement planning are included within the integrated Feasibility Study/Environmental Assessment.

b. General Description

This Section 404(b)1 evaluation addresses the discharge of dredged or fill material into the waters of the U.S. The objective of the SNWW Navigation Improvement Project is to improve the efficiency of the deep-draft navigation system.

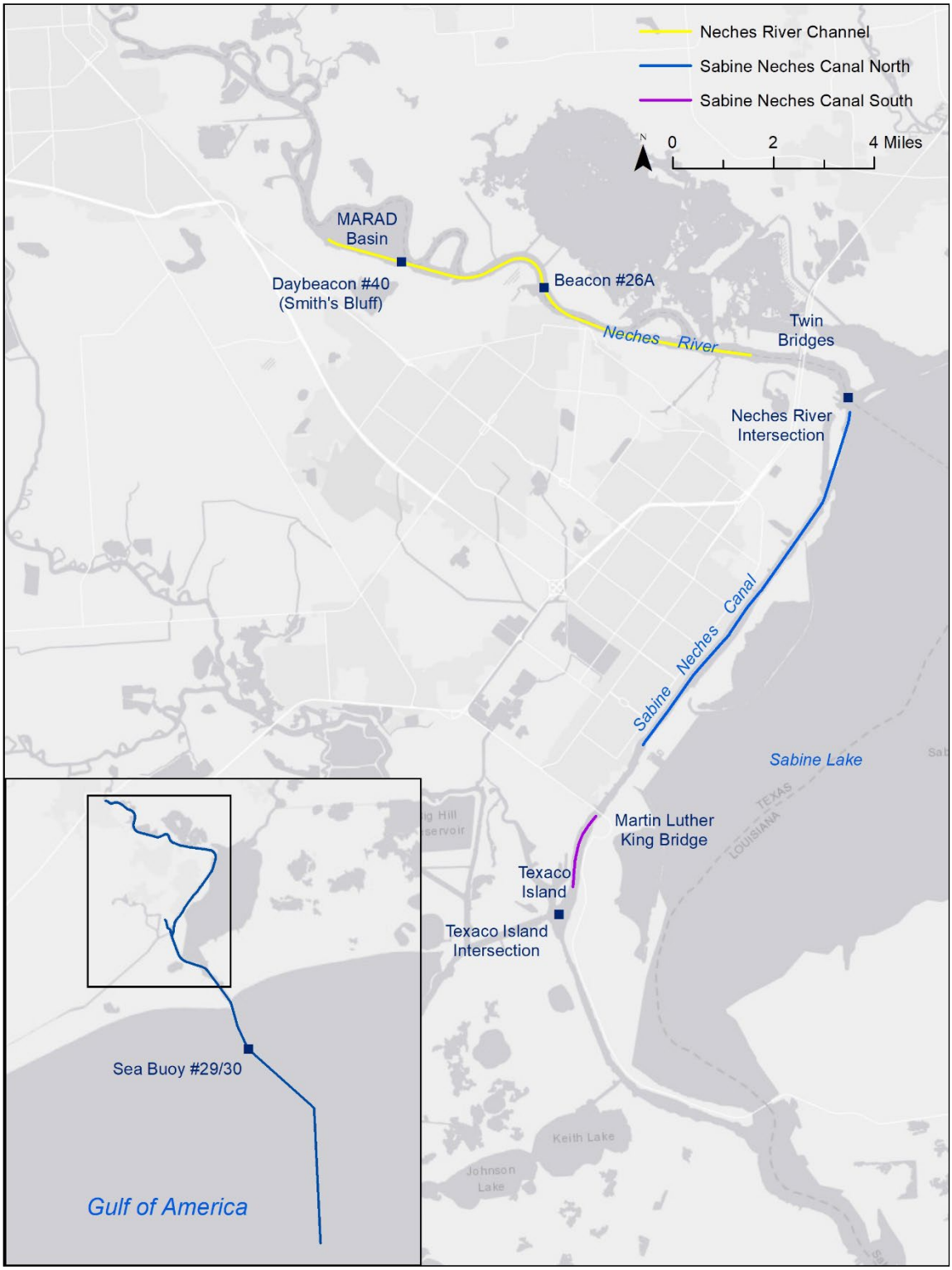
To achieve navigation efficiency objectives, the following is proposed:

The proposed action would widen approximately 19.4 miles of the SNWW in three discontinuous lengths of the inshore channels by 100 feet (from 400 to 500 feet) on the left descending bank as shown in Figure 1. The 100-foot widening would be performed within areas designated as the:

- Sabine-Neches Canal (South) (magenta line in Figure 1),
- Sabine-Neches Canal (North) (blue line in Figure 1), and
- Neches River Channel (yellow line in Figure 1).

[1] 3,200 square miles is the area included in water quality modeling, see Engineering Appendix.

Figure 1
Proposed Segments of the SNWW to be Widened



The depth of the proposed areas to be widened would match the adjacent channel depths when the ongoing 48-foot deepening construction is completed. When constructed, the proposed action would eliminate the nighttime restriction on large vessels transiting the channel and would reduce restrictions on vessel meetings (i.e., vessel passing). With consideration of the costs of construction and maintenance, the proposed action is also the plan that provides the largest net economic benefit.[2]

The segments of the navigation channel excluded from the proposed widening (i.e., the segments of no proposed widening between the magenta, blue, and yellow lines) were excluded because representatives from the Sabine Pilots Association indicated that they would not meet vessels within these reaches. As shown in Figure 1, the sections that would not be widened are proximate to the Martin Luther King Bridge across the Sabine-Neches Canal, the Twin Bridges across the Neches River, and the bend at the confluence of the Sabine-Neches Canal and the Neches River Channel.

Structural and non-structural measures were examined to address the navigational improvement needs within the waterway's inshore channels.[3] Within the interior channels being assessed for improvement, all widening measures examined were along the left descending bank because of the extent of infrastructure along the right descending bank (i.e., on the other side of the channel).

To achieve resource protection, the following is required:

- Control dredged material placement to existing confined material placement areas (i.e., use the available upland dredged material placement areas) so that the placement of dredged material would avoid effects to existing marsh by avoiding the need to establish new upland placement areas;
- reduce turbidity to the lowest practicable level using the normally accepted best management dredging practices;
- continuously monitor (24-hours a day) the placement areas during placement operations and the personnel monitoring the dikes shall be in radio contact with the dredge;
- provide and maintain minimum field-type sanitary facilities and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Also obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system;
- obtain an updated IPaC report from the U.S. Fish and Wildlife Service at the time of construction to provide an updated list of the threatened and endangered species and any critical habitat that has been designated within the potentially affected area to verify there have been no changes since the completion of the environmental coordination;
- comply with applicable federal, state and local laws, rules and regulations governing the placement of materials and wastes in navigable waters including approval of the appropriate Texas Commission on Environmental Quality for the discharge of materials and wastes in the navigable waters within its jurisdiction, and including the provisions of 33 USC 1342 (National Pollutant Discharge Elimination System);

[2] The largest economic benefit is the largest benefit relative to the economic cost of the project, also referred to as the National Economic Development (NED) Plan.
[3] The offshore channels of the SNWW do not restrict vessel traffic.

- exercise precaution to prevent dredged material and dredge effluent from flowing into areas or waterways and ditches not designed for the deposit of dredged material or the flow of effluent runoff;
- exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300;[4] and
- do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States. Authorization to enter specific waters of the United States identified does not relieve the contractor from any obligation to protect other waters of the United States within, adjacent to, or in the vicinity of the construction site and associated boundaries.

Each dredging contract includes the requirement for a contractor to prepare and submit an environmental protection plan (EPP) to present an overview of known or potential environmental issues that must be considered and addressed during construction.

The contractor's EPP shall include:

- a project-specific stormwater pollution prevention plan (SWPPP) that meets the requirements of 40 CFR 122.26 and the Texas State General Permit for stormwater discharges from construction sites prior to the commencement of work;
- a construction site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage areas (on-site and off-site)), access and haul routes, avenues of ingress/egress, locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking;
- the contractor's dredge spill contingency plan including procedures to be followed in the event of a spill where (1) the dredge shall cease operations in a placement area, (2) immediately notify the Contracting Officer who in turn will notify U.S. Fish and Wildlife Service, Texas Parks and Wildlife, and Texas General Land Office, (3) submit a specific clean-up plan for approval, and (4) no clean-up actions will commence until the plan has been approved;
- requirements to maintain spill cleanup equipment and materials at the work site so that, in the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Fire Department, the Command Duty Officer, the Environmental Office, the Contracting Officer and the Texas Commission on Environmental Quality;
- drawings that identify features for environmental consideration (e.g., proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil);
- construction related objectives, targets, and measures for protecting natural and cultural resources as well as the measures the contractor must implement for protecting these resources;

[4] https://ecfr.io/Title-40/Part-300

- a work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse;
- requirements for depositing material in confined areas using methods that reduce conditions conducive to breeding of mosquitoes, flies, and other disease-bearing insects and pests and will prevent or control the release of obnoxious odors and gasses deleterious to human life and property;
- measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control, and
- monitoring of discharge effluent from each placement area spillway/weir and the corresponding receiving body of water shall be sampled at least twice daily. If the effluent density exceeds eight (8) grams per liter for total suspended solids (TSS) more than the corresponding density of the receiving body of water, the contractor may either: add ponding capacity by raising the spillway invert within the placement area or discontinue dredge placement into the placement area until the effluent density returns to an acceptable eight (8) grams per liter differential or less. Samples of the receiving body of water shall be taken upstream or opposite to the direction of tidal flow where the discharge effluent enters the channel.

The dredge contractor must provide written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. This notification must include the locations where various types of waste would plan to be disposed or recycled and include letters of acceptance from the receiving location(s) demonstrating the disposal plan before transporting wastes.

With the comprehensive consideration of the environmental consequences in the Feasibility Report and Environmental Assessment, and description of the environmental protection measures to avoid impacts (i.e., Best Management Practices), there are no significant environmental resources that would require replacing or providing substitute resources of environments. Because the preceding actions are taken to avoid and minimize impacts to significant ecological resources, there remains no unavoidable environmental effects to significant ecological resources by carrying out the proposed action. The proposed widening is the least environmentally damaging practicable alternative.

c. Authority and Purpose

Under Section 203 of the Water Resources Development Act (WRDA) of 1986, as amended, the Sabine Neches Navigation District (SNND) is completing a feasibility study with environmental compliance documentation (environmental assessment) of a proposed navigation improvement project to the Texas portion of the federal channel at the Sabine-Neches Waterway.

Under the Section 203 authority, a non-federal interest (i.e., the SNND) can develop and submit a completed feasibility study to the Secretary of the Army for review to determine if the study, and the process under which the study was developed, comply with federal laws and regulations applicable to feasibility studies of water resources development projects. By completing the feasibility study in this fashion, the non-federal interest can evaluate and propose a modification

to the federal navigation channel without needing project-specific Congressional authorization to initiate a new investigation.

Under existing and without-project conditions, the Sabine Pilots Association impose daylight-only transiting restrictions and no vessel meeting restrictions on much of the existing and projected future fleet using the SNWW. Widening the channel, or selected channel reaches, would allow the Pilots to reduce transiting restrictions that would result in increased navigation efficiency at the SNWW.

The SNWW is currently being deepened from -40 feet to -48 feet, but the ongoing Deepening Project does not widen the channel and current navigation restrictions will remain in effect after the channel is deepened. During the ongoing deepening, the channel will remain 400 feet wide in the Sabine-Neches Canal and the Neches River reaches. Detailed vessel operating data for 2019 was obtained from the Sabine Pilots Association, terminal operators, vessel operators, and the US Coast Guard to understand the nature of SNWW congestion and to develop a model to evaluate alternative improvement measures to reduce channel congestion. Based on navigation rules for the Waterway, Panamax vessels cannot meet other Panamax-size or larger vessels in the 400-foot-width channel reaches; in 2019, there were 4,300 transits by Panamax-size or larger vessels. In addition, navigation rules for the Waterway prevent Aframax and Suezmax vessels from transiting the 400-foot channel reaches at night; during 2019 there were delays for 1,200 vessels with daylight restricted transits.

Navigation restrictions required for the 400-foot-wide channel cause substantial congestion and vessel delays. Vessels that are too large to meet in the narrow channel must wait for the channel to clear before entering from the sea or leaving from the dock. Vessels too large for nighttime transits must wait for daylight and a clear channel before entering from the sea or leaving from the dock. These navigation rules from the Waterway cause these delays and also exacerbate weather delays because the more time a vessel spends in the system the more exposed that vessel is to seasonal weather delays.

There has long been a concerted effort among SNWW users to reduce delays and maximize navigational efficiency along the waterway. Vessel scheduling, the use of "caravans," and queuing rules are all a part of the choreography of getting vessels to and from their berths as efficiently as possible. The effectiveness of these operational efforts is limited by the physical constraint of a 400-foot-wide channel, the size of vessels using the channel, and the number of these vessels.

d. General Description of Dredged and Fill Material

(1) General Characteristics of Material

Site Geology

The geology in the affected area is characterized by modern marine deposits overlaying recent Holocene deposits that in turn overlay Beaumont and Lissie Formations of the Pleistocene Series (USACE, 2011). The modern deposits are generally consolidated clays, silts, and fine sands that were deposited through natural overwash and sedimentation processes or through dredged material placement (USACE, 2010). The recent deposits of the Holocene are generally encountered to depths of 30 to 40 feet and consists of silts, clays, silty sands, clayey sands, and clayey silts that

exhibit the characteristics of normally, to lightly overconsolidated materials (USACE, 2011). The Beaumont Clay is the predominant Pleistocene formation whose eroded surface forms the upper limit of stiff to very stiff clay material; lenses of fine grained, poorly graded sand and silt, and calcareous nodules are sometimes encountered in this formation (USACE, 2011).

Field Exploration

A review of historical and recent boring logs of the previously undisturbed sediments to be dredged for the Deepening Project showed that new work material along the Neches River Channel is primarily comprised of very soft clays with intermittent very loose to loose sands and clayey sands (SNND, 2024). The new-work material along the Sabine-Neches Canal North is primarily comprised of very soft to stiff clays and the new work material along the Sabine-Neches Canal South is primarily comprised of firm to stiff clays and very loose to loose sands (SNND, 2024). Based on recent subsurface soil borings in the Sabine-Neches Canal, more than 75-percent of the new-work material is cohesive clays and sandy clays with a strength/density of medium (36-percent), stiff (36-percent), and very stiff (6-percent).

Bed sediments (i.e., the material removed during maintenance dredging) average 62-percent silt and clay and 38-percent sand in the Neches River Channel and 78-percent silt and clay and 22-percent sand within the Sabine-Neches Canal (USACE, 2011).

Adjacent to the waterway and in dredged material placement areas, the terrestrial soils are classified as Ijam clay ranging from poorly drained to well drained clays and sands and typically occur on zero to five percent slopes (USDA, 2006)

Excavatability

Based on a review of soil borings in the areas to be widened and as affirmed in the Engineering Appendix, all of these materials are suitable for removal with a 30-inch cutterhead suction (pipeline) dredge.

(2) Quantity of Material

New-Work Material

Dredging the widened areas would be performed by a 30-inch cutterhead suction (pipeline) dredge capable of 15,000 cubic yards/day of production on new-work[5] material and would remove nearly 11.7 million cubic yards of new-work dredged material as described in the FS/EA and Engineering Appendix.

Because the downstream-most area for widening (Sabine-Neches Canal (South) segment, magenta line in Figure 1) is already relatively deep water, widening in the Sabine-Neches Canal (South) segment would not result in any changes to adjacent shoreline or land. As such, the area of upland disturbance for the Sabine-Neches Canal (South) segment is zero acres because the entire footprint of disturbance for this segment would be under water.

[5] The term "new-work" refers to the material outside of current channel geometry template that would be removed to widen the channel to the new dimensions.

Within the Sabine-Neches Canal (North) segment (blue line in Figure 1), 1.3 miles of shoreline and a total of 10.9 acres of uplands would be converted to open water. Within the Neches River Channel segment (yellow line in Figure 1), 1.2 miles of shoreline and a total of 6.2 acres of uplands would be converted to open water. Constructing the proposed action would affect a total of 2.5 miles of shoreline and 17.2 acres of upland habitat.

Maintenance Material

Maintenance dredging of the Sabine-Neches Canal and Neches River Channel would be assumed to be performed by a 30-inch cutterhead suction (pipeline) dredge capable of up to 25,000 cubic yards/day. The proposed action would not be expected to change the frequency of maintenance dredging within the waterway, but would increase the footprint of the navigation channel being maintained and the volume of maintenance material generated per maintenance dredge cycle. The increase in the maintenance material was estimated to be an increase of slightly over half a million cubic yards per year and would add approximately 20 additional days per year of maintenance dredging to the approximately 130 days per year of maintenance dredging that is done annually for the Sabine-Neches Canal and Neches River Channel combined.

e. Description of the Proposed Discharge

(1) Location

Dredged material would be transported from the pipeline dredge as a slurry through temporary pipelines and hydraulically discharged into existing designated upland dredged material placement areas (PAs) adjacent to the areas being dredged. Figure 2 shows the location of the existing PAs and the segments for proposed widening (yellow, blue, and magenta).

In addition to the placement of dredged material into the existing confined upland PAs, the proposed action includes using a portion of the dredged material for addition to an existing beneficial use (BU) marsh restoration nearby. As depicted in Figure 3, part of the ongoing Deepening Project the construction and use of the Neches River BU feature (Rose City East, Bessie Heights East, and Old River Cove) will be built (USACE, 2011). The ecosystem benefits from the Bessie Heights East marsh restoration presumed 1,000,000 CY of new work and then pumping an unspecified quantity of sediment during seven different maintenance cycles (each separated by four years) over 28 years to complete construction (USACE, 2011). When completed, the Neches River BU feature will have a total of 2,853 acres of emergent marsh (USACE, 2011) and over the 50-year period of analysis and 1,896 acres of restored marsh habitat would be built the Bessie Heights East BU component of the Neches River BU features. As a component of the proposed action, up to 500,000 CY of dredged material would be utilized to build marsh in the Bessie Heights East site. The Bessie Heights East BU site is scheduled for construction within Contracts 8 and 9 of the ongoing deepening (2028-2029) and is reliant on the availability of dredged material in proximity. Providing BU material to the Bessie Heights East site as part of the Recommended Plan/Proposed Action was encouraged by the USFWS in their Planning Aid Letter for the proposed widening (USFWS, 2024).

Figure 2
Dredged Material Placement Areas Along the SNWW

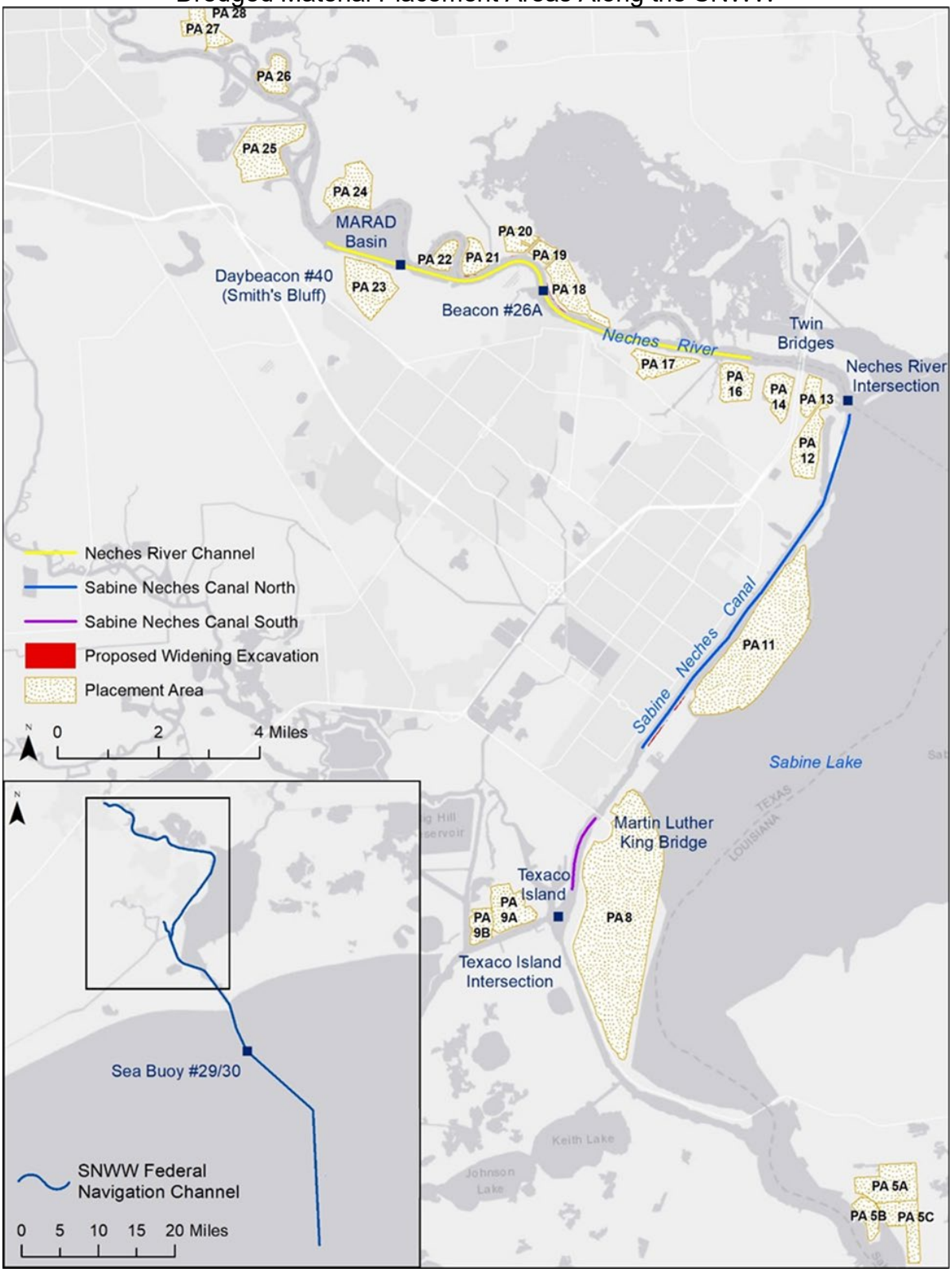
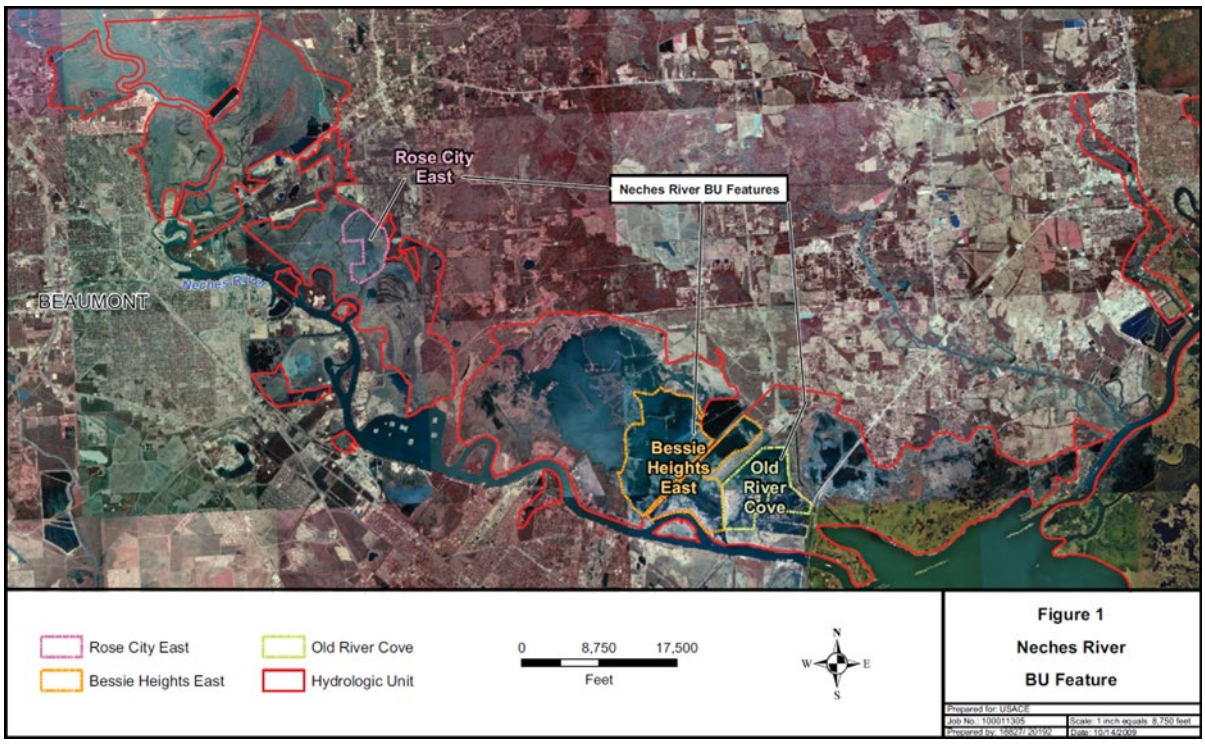


Figure 3
Neches River Beneficial Use Features



(2) Size

As described in the Engineering Appendix, review of the existing dredged material planning and available capacity in the PAs demonstrates that sufficient placement capacity is available for all channel deepening and channel widening new-work as well as the 50-year projected volume of material generated by maintenance dredging. As such, the evaluation in the Engineering Appendix demonstrates that sufficient placement capacity is available for all widening-generated new-work as well as future increased maintenance volumes without the need to develop new dredged material placement areas. Implementing the proposed action and managing the associated increased future maintenance material would not require designing, citing, or constructing any additional dredged material placement areas.

Also, as depicted in Figure 3, the USACE marsh restoration and beneficial use planning for Bessie Heights East would easily accommodate the 500,000 CY from the proposed widening.

(3) Type of Site and Habitat

As depicted in Figure 2, there are more than 1,500 acres within existing dikes of placement areas along the waterway that are maintained and operated for dredge material placement; these placement areas will continue to be used over the 50-year period of analysis. The original construction, ongoing use, and all improvements and maintenance of the placement areas was evaluated in the 1975 EIS (USACE, 1975) that examined the environmental effects from dredge material management. This work included future maintenance dredging and the continued use,

management, and improvement of the dredged material placement areas (USACE, 1975). Over the 50-year period of analysis for the proposed action, the dredged material placement areas would continue to receive dredged material, have episodic raising of containment dikes to increase storage capacity, and require routine maintenance and in-kind replacement of support features within and surrounding the placement areas (e.g., access road construction and maintenance, vegetation control, levee lifts and maintenance, weir maintenance).

Dredged material from constructing the proposed widening, and the increased future maintenance material from dredging would not require the design, site selection, or construction of any additional dredged material placement areas (SNND, 2024). As under current practices, heavy equipment (e.g., dozers, excavators) would be used within and around the PAs to ensure proper material distribution within the dikes and effluent would be released (and monitored) from the PAs through existing weirs.

Dredged material placed within the existing placement areas would not affect any areas of new habitat as these areas are, have been, and will continue to be dedicated to dredge material placement as described in the Dredged Material Management Plan. Detailed analyses of the existing upland placement area volumes and sufficiency of the existing placement areas to receive the proposed new-work and maintenance material are in the Engineering Appendix.

Placing these materials into the Bessie Heights East BU site would accelerate marsh habitat restoration and the associated ecosystem benefits would accrue sooner than using only deepening project material. The existing degraded area of Bessie Heights East is 2-3 feet deep standing water with no marsh; providing dredged material would accelerate marsh restoration.

(4) Time and Duration of Discharge

New-work construction of the widened areas would take approximately 30 months assuming a 30-inch cutterhead suction (pipeline) dredge capable of 15,000 cubic yards/day of production. The additional area to be maintained (i.e., because of the widened portions of the channel) would be expected to add approximately 20 days of additional maintenance dredging per year, as described in the FS/EA. These 20 days would be in addition to the estimated 130 days per year to maintain the deepened Sabine-Neches Canal and Neches River Channel reaches if no widening were constructed.

f. Description of Disposal Method

As described in the FS/EA and Engineering Appendix, hydraulic pipeline (i.e., cutterhead) dredges would be used to widen the channels. These are the same types of dredges that annually maintain the inshore channels of the SNWW and have also been utilized to deepen the existing SNWW inshore channels. Dredged material would be transported from the pipeline dredges as a slurry through temporary pipelines and hydraulically discharged into existing designated upland dredged material placement areas. Disposal of the new work material would be within the existing upland PAs and the existing dredged material placement areas are near the navigation channel and areas for proposed widening.

As described in Section b, General Description, dredging contracts would be written to not only emphasize the removal of material from the channel, but also emphasize successful completion of

mitigation and restoration features so that they would perform to intended purposes. Best Management Practices (BMPs) may be implemented where appropriate to control and reduce turbidity during dredging and placement.

2 Factual Determinations

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope

The placement areas to be used for dredge material are surrounded by containment dikes and maintenance access roads. These areas have been modified extensively by upland placement areas construction and dike maintenance and elevation raising, vegetation control measures, as well as past placement activities. The dikes containment holds water and dredged sediment to isolate the areas from adjacent waterbodies, protecting the adjacent habitat from uncontrolled release.

Placement into the Bessie Heights BU site will be making additional material available where ongoing construction of marsh will have already begun and need almost 30 years to complete.

(2) Sediment Type

Material to be removed in the Neches River Channel widening is primarily comprised of clay and sandy clay (65-percent), silty sand/clayey sand (20-percent) and loose sands (15-percent) (see Engineering Appendix). The material to be removed in the Sabine-Neches Canal widening are primarily clay and sandy clay (97-percent) silty sand/clayey sand (2.5-percent) and loose sands (0.5-percent) (see Engineering Appendix).

(3) Dredged/Fill Material Movement

Upland PAs would have containment levees to control fill movement after deposition.

The placement of dredged material into the open water of these areas of Bessie Heights East results in short-term (negative effects from marsh construction) and long-term effects (beneficial effects from habitat restoration) within the existing open-water communities. During placement within the BU features, minor amounts of suspended solids may occur during construction and placement. The BU feature design assumed "*The marsh would be constructed by the unconfined flow of dredged material from a hydraulic pipeline. Frequent pipe movement and careful elevation control would be necessary to obtain the appropriate marsh elevations. Topographic relief would be created by varying the final elevation of material placement…"* (USACE, 2011).

(4) Physical Effects on Benthos

Temporary and localized removal of riverine benthic organisms in the areas to be dredged would occur; however, benthic organisms would quickly recolonize. Additionally, placement of dredged material in the BU features would change the composition of the benthic community (i.e., slightly different benthic community in shallower water than in the pre-placement conditions), but would not be significant because recolonization is rapid and the community composition in the restored marsh of the BU features would be more desirable than the unrestored open water condition.

(5) Other Effects

None known.

(6) Actions Taken to Minimize Impacts

Actions listed above in Section b. General Description "*To achieve coastal resource protection*" are all actions that will be taken to minimize impacts.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water

The dredging and placement operations are expected to have only minor, short-term (i.e., temporary) effects on water quality in the area.

a. Salinity

As described in the FS/EA and Engineering Appendix, three-dimensional (3D) numerical modeling for analysis of hydrodynamics (i.e., current speed, water elevation, salinity, temperature) was performed to assess the potential effects on water quality from the proposed widening.

Conclusions from those analyses were:

- Within the navigation channel and Neches River target locations, average surface salinity increased by 0.03 practical salinity units (PSU) due to the proposed action with a maximum increase 0.34 PSU. There was no change in average bottom salinity at these target locations due to the TSP with a maximum salinity increase of 0.08 PSU;
- At all other target locations, average surface salinity decreased by 0.01 PSU (maximum increase of 0.12 PSU) and average bottom salinity decreased by 0.02 PSU (maximum increase of 0.08 PSU); and
- The calculated salinity changes due to the proposed widening as compared to the no action alternative (i.e., the baseline) are negligible.

b. Water Chemistry

Aside from a temporary increase in local suspended solids during construction, no changes to water chemistry would be expected (See the FS/EA).

c. Clarity

The localized temporary decrease in water quality would result from an increase in turbidity and suspended sediments during initial construction and routine maintenance dredging. Additionally, short-term increases in turbidity within the Bessie Heights East BU feature would be expected because of the unconfined flow of dredged material during construction of the restored marsh.

d. Color

Water immediately surrounding the active dredging area may become discolored temporarily due to disturbance of the sediment. BMPs would be implemented to reduce and control turbidity.

e. Odor

There should be no odors associated with dredging and placement.

f. Taste

No detectible effects on the estuarine environment would be expected.

g. Dissolved Gas Levels

No detectible changes to dissolved gas levels would be expected.

h. Nutrients

As with any dredging project, a mobilization of nutrients and detritus from the bottom, is possible. The effect of such a nutrient mobilization would be localized and temporary.

i. Eutrophication

The localized temporary decrease in water quality could result from a mobilization of nutrients and detritus from the bottom, potentially leading to a localized reduction in dissolved oxygen. The effect of such eutrophication would be localized and temporary.

j. Others as Appropriate

None known.

(2) Current Patterns and Circulation

Due to the complexities within the affected area, a tidal hydrodynamic and salinity transport model was developed to estimate changes to water elevation, current speeds, and the overall hydrologic regime due to the proposed widening. The comprehensive analyses are presented in the FS/EA and the Engineering Appendix.

a. Current Patterns and Flow

The proposed action was not shown to have discernible effects on currents or circulation patterns based on hydrodynamic modeling as presented in the FS/EA and Engineering Appendix.

b. Velocity

As described in the FS/EA and Engineering Appendix, a series of MIKE 21 Flow Model HD FM model scenarios were developed to investigate the influence of widening portions of the SNWW channel on hydrodynamics associated with typical tidal activity. Model results for the alternative conditions were compared based on peak absolute current velocity and peak flood and ebb current velocity and direction. The modeling showed a small decrease in the maximum current speeds

within the widened segments of the channel and a small increase in current speeds for areas that are not widened, but in all cases, the greatest current speed differences were approximately 0.2 meters per second. This result was consistent for both flood and ebb tides. Additionally, the largest modeled result is less than the model uncertainty bounds of 0.3 meters per second. This small, predicted change to current speed due to the widening would not affect navigation or shoaling rates (Engineering Appendix).

c. Stratification

No change to the existing patterns of stratification would be expected with the proposed widening.

d. Hydrologic Regime

Hydrologic and tidal regimes would not be measurable altered. See Engineering Appendix.

(3) Normal Water Level Fluctuations

Based on the results of the modeling, the changes to peak surge elevations due to the channel widening are de minimis and the Project is not expected to have an impact on the surge elevations or durations around the SNWW (see Engineering Appendix).

(4) Salinity Gradients

The calculated salinity changes due to the proposed widening as compared to the no action alternative (i.e., the baseline) are negligible.

(5) Actions That Will Be Taken to Minimize Impacts

See Section b above.

c. Suspended Particulate/Turbidity Determination

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site
(2) Effects on Chemical and Physical Properties of the Water Column
    a. Light Penetration
    b. Dissolved Oxygen
    c. Toxic Metals and Organics
    d. Pathogens
    e. Aesthetics
    f. Others As Appropriate
(3) Effects on Biota
(4) Actions Taken to Minimize Impacts

Construction would result in construction related temporary water quality deterioration (e.g., localized increase in turbidity) typical of pipeline dredge work within and adjacent to a maintained federal navigation channel. The overall degradation of water quality would be minor as methods for dredging and placement in confined upland placement areas have been proven to be effective

and not unacceptably degrade water quality. Dewatering from the existing confined upland placement areas takes place through monitored outfalls.

d. Contaminant Determinations

An assessment of the information provided in the 2011 FEIS (USACE, 2011), 2017 Sabine Pass to Galveston Bay FEIS (USACE, 2017), and additional research of government records (SNND, 2023) indicate that the potential for encountering contaminated material requiring specific handling and remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) during dredging operations is considered minimal for the recommended plan/proposed action. This conclusion is further supported by the fact that the proposed channel widening would occur on the left descending bank, beyond the maintained navigation channel opposite the identified priority HTRW sites on the right descending bank (SNND, 2023).

e. Aquatic Ecosystem and Organism Determinations

Placement of material into the confined placement areas would result in no deleterious effects on plankton, benthos, nekton, the aquatic food web or any special aquatic sites.

Because such a large area of open water will be converted to shallow marsh with emergent vegetation in the Bessie Heights East BU site, the areas of quiescent water surrounding the marsh habitat will allow submerged vegetation to flourish quickly after construction (USACE, 2011). The construction of the BU site would create long-term beneficial effects for fisheries by improving the complexity and diversity of marsh habitats as described in the 2011 FEIS (USACE, 2011).

f. Proposed Disposal Site Determinations

Because the proposed action would utilize confined upland placement for the disposal of the vast majority of the dredged material, there are no disposal site determinations. Placement of dredged material into the Bessie Heights East BU site is for beneficial use and marsh creation, a net benefit where placed.

The overall risk of significant water quality effects would be low as the methods for construction and maintenance are well understood and proven to be effective and not unacceptably degrade water quality during ongoing SNWW channel deepening or the ongoing routine maintenance dredging on the waterway.

g. Determination of Secondary Effects on the Aquatic Ecosystem

None.

3 Literature Cited

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