DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
NEW ORLEANS LA 70118-3651

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana
Neptune Pass Rock Closure
Plaquemines Parish, Louisiana
Environmental Assessment #589

Introduction: The U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN), has prepared Environmental Assessment #589 (EA #589) in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. The EA assesses the potential impacts associated with constructing flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana. In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed in EA #589.

In August 2024, USACE released a revised Draft EA #589 to address design updates since September 2022 and associated FONSI initiating the 30-day public and agency review period (August 2, 2024 to September 3, 2024). During the public review period, USACE received letters of support as well as critical feedback from both the public and non-governmental organizations regarding the proposed action, specifically the design of the Neptune Pass Flow Reduction Structures (Inlet and Outlet structures)[1]. In response to requests for additional modeling information associated with the Inlet and Outlet structures, USACE released the draft November 2023 Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure[2], prepared by the USACE, Engineering Division, Hydrology, Hydraulics, and Coastal Engineering Branch and Lower Mississippi River and Tributaries Engineering Branch. At that time, the proposed project was still in the Engineering and Design Phase for both the Inlet Structure and Outlet structures. More specifically, USACE was in the Geotechnical Design Phase and actively incorporating geotechnical information into the design of the project features. In December 2024, USACE completed the Geotechnical Design Phase and has since refined the proposed action. The proposed action design changes from the August 2024 draft to the final EA #589 are described in *Revised Proposed Action*. Final EA #589 has been updated to include the revised designs and is incorporated by reference.

Project Authority: The project, "Mississippi River, Louisiana, Between Baton Rouge and New Orleans" was authorized by the River and Harbor Act of 1925, in accordance with the report of the Chief of Engineers published as House Document Number 105, 69th Congress. The project, "Mississippi River at and near New Orleans, Louisiana was authorized by the River and Harbor Act of 1937 in accordance with the report of the Chief of Engineers published as House Document

[1] Refer to EA #589 Appendix B – Public Comments and Responses.
[2] Refer to EA #589 Appendix C – draft November 2023 Neptune Pass Model Report.

597, 75th Congress. The project, Mississippi River, Baton Rouge to the Gulf of Mexico, was authorized by Section 2 of the River and Harbor Act of 1945 (PL 79-14) in accordance with the report of the Chief of Engineers in House Document No 215 of the 76th Congress, and by the River and Harbor Act of 1962 in accordance with the report of the Chief of Engineers in Senate Document No. 36 of the 87th Congress. The project, "Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana" was authorized by the Supplemental Appropriations Act of 1985 and by Section 201 of the Water Resources Development Act of 1986, both in accordance with the Report of the Chief of Engineers dated April 9, 1983.

Although the Water Resources Development Act of 1986 authorized the construction and maintenance of the Mississippi River ship channel to a depth of 55 feet, current approved construction, as supported by a Project Partnership Agreement with the Louisiana Department of Transportation and Development, is currently being constructed and ultimately maintained (when constructed) to a depth of 50 feet. For the project reaches below the Port of New Orleans, the approved channel depth of 50 feet has been constructed and is being maintained, as necessary to sustain that depth. The proposed work at Neptune Pass must be performed in order to maintain the integrity and safety of the 50-foot navigation channel in this reach of the river.

Purpose and Need for the Action: The purpose of the proposed action is to eliminate a navigational hazard in the Mississippi River. Neptune Pass is a natural crevasse which existed prior to 1985 but has increased significantly in size and flow during recent annual high river events, with a noticeable enlargement after 2019. This newly enlarged pass is diverting approximately eight times more water than the other five adjacent outlets combined in this 3-mile reach of the Mississippi River. In an effort to best reduce sedimentation within the Mississippi River attributed to the expansion of Neptune Pass, the location and dimensions of the proposed action were designed to approximately match the outlet before the riverside bank protection failed and the pass was allowed to develop. Approximately 16% of the Mississippi River is currently being diverted through Neptune Pass. Once construction of the Neptune Pass control structure is complete, diverted flow through the pass should be reduced to 6% of river flow, which is the historical flow rate prior to expansion of Neptune Pass in 2019. However, flow through the pass will vary according to river stage within the vicinity of the project (USACE 2023).

Construction of flow control features within Neptune Pass (inlet structure) and Quarantine Bay (outlet structures – SREDs) would decrease riverbank scour and erosion within the Pass and control water flow being diverted from the Mississippi River. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths. In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling within the river. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The large amount of water flowing through Neptune Pass is also resulting in reports by river pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river, and the segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing progressive channel stabilization to prevent any

alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

Revised Proposed Action:

Neptune Pass Flow Reduction Structures

(All elevations referenced for the proposed action structures are to North American Vertical Datum 1988 (NAVD88) (epoch 2004.65), unless otherwise noted).

The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of America from continuing to grow. The proposed action comprises two features that would work together to provide a sustainable solution to remove the hazard. There would be stone placed to raise the existing riverbank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There would be Sediment Retention Enhancement Devices (SREDs) built with earthen material excavated from adjacent mud-bottoms, as well as placement of geotextile fabric and stone riprap. The SREDs would be constructed at the outlet of Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features would be placed in navigable water.

Based upon geotechnical analysis completed in December 2024, USACE determined that a phased construction approach of the inlet and outlet structures was warranted to further assess the real time effects on Navigation during periods of high river flow and to be able to plan efficient and cost effective follow up actions, as needed. The proposed phased construction and real time monitoring approach would include the following:

- Phase 1 - construction of a modified, less restrictive stone inlet structure at the at the entrance of Neptune Pass that is similar to the proposed structure as described in draft EA #589.
- If warranted, Phase 2 - raise the Phase 1 stone structure to further reduce the cross-sectional area of the entrance of Neptune Pass.
- If warranted, Phase 3 - construct the outlet structures (i.e., Sediment Retention Enhancement Devices (SREDs)) in a modified configuration. The SREDs would be designed to increase the elevations in Quarantine Bay at the outlet of Neptune Pass to back up the flow and decrease the flow capacity. The SREDs would consist of dredged material, stone, geotextile, wooden piles, or a combination of these options.
- Upon completion of each phase of construction, multibeam surveys and flow measurements will be conducted routinely to assess the effects to bathymetry and flow in Neptune Pass and the Mississippi River. Post construction of the inlet structure, USACE will engage with the navigation industry to determine any positive or negative real time effects on navigation.

The modeled flow after Phase 1 construction of the revised design inlet structure is expected to be approximately 125,000 cubic feet per second (cfs) at a Mississippi River flow of 1 million cfs.

If Phase 2 and Phase 3 are constructed, once those features are complete, the target flow is expected to be approximately 80,000 cfs at a Mississippi River flow of 1 million cfs. Refer to final EA #589: Figure 1 shows the project area with inlet and outlet structures.[3]

Inlet Structure – Revised Design[4]

The proposed Neptune Pass Inlet Structure is a stone sill that would reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure would begin with a tie in at the end of the Mississippi River foreshore dike on the upstream side of the Neptune Pass inlet and would end with a tie in at the end of the Mississippi River foreshore dike on the downstream side of the Neptune Pass inlet. The revised design of the structure includes varying extension distances, crown elevations, crown widths, river side slopes, and land side slopes along the alignment. The structure alignment would be shifted slightly riverward, side slopes of the structure would be shallower, and there would be an overall reduction in area of the stone paving on the pass side of the structure. Based on geotechnical borings and analysis, shallower slopes and slight shift in alignment are needed to achieve acceptable factors of safety. The elevation crown notch would be shifted downstream to the narrower part of the existing bank line ridge with an elevation of -26 feet. The crown elevation would be -8 feet extending toward both banks, replacing areas that were previously at a +5 feet elevation (i.e., inlet structure original design). The cross-sectional area at the inlet to Neptune Pass has increased from 7,200 square feet to 10,300 square feet for Phase 1. There would be an elevation transition slope of 1 vertical on 2 horizontal (1V:2H) between the design elevations. The structure would cover approximately 331,700 square feet and be constructed with approximately 330,200 tons of stone. A 3-foot-thick layer of stone paving scour protection would cover approximately 42,700 square feet requiring approximately 7,700 tons of stone and would be placed approximately 325 feet into the pass from the crown of the structure. The alignment and design are listed below in Table 1. Refer to final EA #589: Figure 2 shows the revised design inlet structure feature; and Figure 3 shows a side scan rendition of the revised design inlet structure.

[3] Draft EA #589 - The target flow of original inlet structure was approximately 80,000 cfs at a Mississippi River flow of 1 million cfs.

[4] Draft EA #589 – Inlet Structure original design:

- Center of the structure – 100-foot-wide notch at an elevation of -26 feet and a 115-foot-wide crown.
- Side slopes adjacent to center notch – 1V:2H slope to an elevation of -8 feet and a 50-foot-wide crown extending 170 feet upstream and downstream.
- Structure side slopes – 1V:2H slope to an elevation of +5 feet and a 5-foot-wide crown tying into the upstream and downstream Mississippi River bank.
- Existing foreshore dike – capped with stone to match the tie in elevation of +5 feet.
- Inlet structure – tie into existing ground at a 1V:1.75H slope perpendicular to the Mississippi River bank.
- Inlet cross sectional area – reduced to approximately 7,200 square feet.
- Structure – constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds.
- Stone Paving scour protection – 3-foot-thick layer of approximately 20,000 tons of 1,200-pound stone placed approximately 325 feet into the pass from the crown of the structure.

Table 1. Revised Design Inlet Structure Specifications.

Feature Length (ft)[5]	Crown Elevation (ft)	Crown Width (ft)	River Side Slope (V:H)	Land Side Slope (V:H)
195	+5	5	1:2	1:3
272	-8	50	1:2.5	1:2.5
148	-8	50	1:3	1:2.5
91	-26	115	1:2	1:2
143	-8	50	1:3	1:3
101	+5	5	1:2	1:3

Outlet Structures

The proposed Neptune Pass Outlet Structures would consist of multiple armored V-shaped SREDs placed between the -6 and -10-foot contour. Barge mounted excavators would be utilized to excavate earthen material from adjacent mud-bottoms and side cast material to create each SRED. It is expected that a total of approximately 520,000 cubic yards of earthen material would be required for construction of the SREDs. The SREDs would have a five-foot top width and would be constructed to a target elevation of +5.0 feet, with side slopes of 1V:2H. Each SRED would consist of multiple terraces that are 300 feet long with 100-foot gaps between each terrace. The SREDs would also require placement of approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile. All work would be via floating plant. Placement of stone would be via barge mounted excavator or dragline. Refer to final EA #589: Figure 4 shows the outlet structure features (SREDs); and Figure 5 shows a rendition of the approximate proposed location of the outlet structures (SREDs).

<u>Alternatives Considered but Eliminated from Further Evaluation:</u>

Alternative 1

Alternative 1 (previous proposed action included in the September 2022 Draft EA #589). This alternative considered the construction of a flow control feature requiring installation of a stone closure structure within Neptune Pass via placement of stones from a barge positioned within the Pass. The structure would be built to an elevation of +5 feet with a 6-foot crown width on a 1V:2H slope perpendicular to the center line with a 100-foot notch constructed at an elevation of -10 feet in the center of the structure. A 2-foot bank paving at the inlet and outlet and 2-foot channel paving at the structure outlet would be constructed as scour protection. Stone key-in of the closure structure would require excavations and extend approximately 150 feet from the top of bank. Approximately 141,000 tons of stone would be placed in an area approximately 4.8 acres in size for construction of the closure structure and bank protection within the Pass. Installation of the key-in segment of the flow control feature would require excavation of approximately 1,500 cubic yards of material and placement of 1,750 tons of stone in approximately 0.4 acres of wetland areas adjacent to the Pass. This alternative received critical feedback from Federal and State agencies, the public, and non-governmental organizations in a September 2022 30-day public

[5] The feature length is the extension distance at a constant design template between the 1V:2H sloping transitions between the elevation changes.

review of Draft EA #589. The performance of the formerly proposed structure was analyzed, and findings presented include output from the 800,000 cfs simulation and suggest that the structure would significantly reduce the flow diverted through Neptune Pass but would induce hydraulic conditions that could result in flanking of the structure and/or additional marsh scour. Under high-flow scenarios on the Mississippi River, the sill-notch structure restricted flow through the pass so much that a significant water surface elevation difference across the structure was created. Continued stress under this high-flow scenario could lead to increased marsh scour, pass enlargement, and potential failure of the structure via flanking, further increasing the flow diverted through Neptune Pass. The potential for flanking and marsh erosion associated with the formerly proposed structure under this alternative rendered its implementation infeasible. After undertaking additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay, it was determined that this alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 2
Alternative 2 considered the construction of the structure on the Mississippi Riverbank at the mouth of Neptune Pass. There is an existing stone dike and revetment up and down stream of the proposed location structure to tie into. Construction on the Mississippi Riverbank would be the way to return to the local geometry to pre-existing conditions. However, the large quantity of stone being placed on a relatively narrow sill with existing stability concerns put the structure at risk of failure. Failure could occur from scour continuing to develop behind the structure as the sediment starved water enters the pass. Flanking of the structure on the upstream or downstream limits at the locations where is pass is already expanding is also a possibility. Either of these failure modes would result in redevelopment of existing conditions. Additionally, preliminary estimates indicate that this alternative would require approximately 211,000 tons of stone to complete, an increase of 70,000 tons of stone from the proposed action. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 3
Alternative 3 considered the construction of a structure without the inclusion of a notch. A full closure would be the most effective means of reducing the shoaling attributed to the expansion of the pass. However, failure resulting from the flanking of the structure on the upstream or downstream limits at locations where the pass is already expanding is a high possibility. Additionally, the 100 feet notch at -10 feet NAVD88 of the proposed action was designed to approximately match this outlet before the bank failed and the pass was allowed to develop. There is the best chance of reducing sedimentation in the Mississippi River by matching the historic stream power at this location to the pre failure conditions. Public concern for maintaining some connectivity from the river to adjacent marsh areas in order to facilitate land gain was also considered in the elimination of a full closure structure design. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 4
Alternative 4 considered the closure of adjacent channels to Neptune Pass to alleviate the shoaling occurring within the Mississippi River. However, the current enlarged outlet through Neptune Pass is diverting approximately four to eight times more water than the five adjacent outlets combined in this three-mile reach of the Mississippi River. Closure of other outlets would not be as effective. Additionally, the shoaling within the Mississippi River adjacent and

downstream of the pass was not observed until after the scouring and enlargement of Neptune Pass occurred. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Factors Considered in Determination: In accordance with NEPA and other applicable laws and regulations, CEMVN has assessed the impacts of the No Action alternative and the Proposed Action. All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the Proposed Action. A summary of the potential effects is listed in Table 2.

Table 2: Relevant resources and their impact status, both adverse and beneficial.

Relevant Resource	Impacted	Not Impacted
Navigation	X	
Aquatic Resources/Fisheries	X	
Wetlands	X	
Essential Fish Habitat	X	
Wildlife	X	
Threatened and Endangered Species		X
Cultural Resources		X
Tribal Resources		X
Air Quality	X	
Water/Sediment Quality	X	

Endangered Species Act of 1973: Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the USFWS concurred with CEMVN's determination of "not likely to adversely affect" in a letter dated May 21, 2024. Specific effect determinations for threatened or endangered species are listed below:

- For the Eastern black rail and pallid sturgeon, USFWS concurred with CEMVN's determination that the proposed action may affect but is not likely to adversely affect this species.

- For the West Indian manatee, monarch butterfly, and tricolored bat, USFWS concurred with CEMVN's determination that the proposed action is not likely to adversely affect this species.

For the West Indian manatee, CEMVN will implement appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees will also be included in the contract specifications.

Additionally, the CEMVN has determined that the proposed project will have no effect on any threatened or endangered species (Gulf sturgeon, giant manta ray, Kemp's Ridley turtle, Loggerhead sea turtle, and Green sea turtle) or critical habitat under the purview of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), Protected Species Division. Under the January 13, 2017 NMFS Procedural Instruction 02-110-20, the NMFS reviewed its consultative responsibilities under Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, and associated regulations at 50 C.F.R. part 402 and determined it will not provide formal written responses to requests for concurrence with a federal action agency's determination that its actions will not affect any ESA-listed species or designated critical habitat ("no effect" determination) (http://www.nmfs.noaa.gov/op/pds/index.html). As such, endangered species consultation with NMFS is complete.

National Historic Preservation Act of 1966: Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The procedures in 36 CFR Part 800 define how federal agencies meet these statutory responsibilities. The Section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation on historic properties, including the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) and any Tribe that attaches religious or cultural significance to historic properties that may be affected by an undertaking. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the USACE has determined that there are no historic properties, as defined in 36 CFR 800.16 (l) within the Neptune Pass area of potential effect (APE). Accordingly, a conclusion of "no historic properties affected" was sent to the Louisiana State Historic Preservation Office (SHPO) and interested federally-recognized Tribes on June 13, 2022. Concurrence from the SHPO was received on June 28, 2022. On July 7, 2022, the Muscogee Nation responded with their wish to defer to other Tribes. On July 11, 2022, the Choctaw of Oklahoma, and on July 13, 2022, the Chitimacha Tribe responded their concurrence with the conclusion of "no historic properties affected". No other tribal responses were received.

The current proposed project includes the same APE as was coordinated by the June 13, 2022 letters, but now adds an APE at the outlet of Neptune Pass, where sediment captures are proposed and will require borrow from adjacent areas. This APE was considered to be within proximity and procedures used to conclude the initial finding of no historic properties affected, and the same conclusion (no historic properties affected) was adopted for the new APE with no further coordination.

Clean Water Act of 1972 – Section 404 and Section 401: A Clean Water Act Section 404(b)(1) Public Notice entitled "Neptune Pass Rock Closure (Plaquemines Parish)" was distributed for public and agency review on August 2, 2024. During the 404(b)(1) Public Notice review period, USACE received letters of support as well as critical feedback from both the public and non-governmental organizations regarding the proposed action, specifically the design of the Neptune Pass Flow Reduction Structures (Inlet and Outlet structures). EA 589 Appendix B contains both public comments and USACE responses received during the 30-day public and agency review period. A CWA Section 404(b)(1) evaluation was completed on February 12, 2025.

CWA Section 401 requires a Water Quality Certification from the Louisiana Department of Environmental Quality (LDEQ) that a proposed project does not violate established effluent limitations and water quality standards. Surface water quality standards are established in the Louisiana Administrative Code (LAC) Title 33, Part IX (2020). The CEMVN received a state-issued 401 Water Quality Certificate for the project on March 21, 2024 (WQC 220830-02/ CER20240001).

Clean Air Act of 1972: The Clean Air Act (CAA) sets goals and standards for the quality and purity of air. It requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The project area is in Plaquemines Parish, which is currently in attainment of NAAQS. A general conformity determination is not required.

Coastal Zone Management Act of 1972: The Coastal Zone Management Act requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manger which is, to the maximum extent practicable, consistent with approved state management programs." A Federal consistency determination, in accordance with the Louisiana Coastal Zone Management Program (LCZMP) pursuant to the Coastal Zone Management Act (CZMA) of 1972, was submitted to the Louisiana Department of Natural Resources (LDNR) on May 3, 2024. By letter dated June 18, 2024, the LDNR, Office of Coastal Management determined that the subject project was consistent with the LCZMP in accordance with Section 307 (c) of the CZMA of 1972, as amended (C20220079 Mod 03).

Magnuson-Stevens Fisheries Conservation and Management Act: The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended, Public Law (P.L.) 104-208, addresses the authorized responsibilities for the protection of EFH by NMFS in association with regional fishery management councils. The CEMVN and NMFS have agreed to complete EFH coordination requirements for federal civil works projects through the review and comment on National Environmental Policy Act documents prepared for those projects. The NMFS, Habitat Conservation Division, reviewed draft EA #589 and responded by e-mail dated August 22, 2024 with no objections to the proposed action.

Fish and Wildlife Coordination Act of 1934: The Fish and Wildlife Coordination Act (FWCA) provides authority for the USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It requires Federal agencies that construct, license or permit water resource development project to first consult with USFWS, NMFS and state resource agencies regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. The USFWS reviewed the proposed project and provided project specific recommendations in a Final Coordination Act Report received on February 12, 2025. The USFWS recommendations for the proposed action are listed below:

1. The Service recommends that the project area is monitored annually post-construction to determine if existing delta splays impacted by the project are experiencing land loss. If monitoring indicates changes from the current conditions, then the need for mitigation will have to be assessed.

Response 1 – Concur.

2. The Service recommends that the project area is monitored annually post-construction to determine if salinities increase beyond expected as well as to determine any changes in marsh types and/or accelerated marsh loss. If monitoring indicates changes from the current conditions, then the need for mitigation will have to be assessed.

Response 2 – Concur.

3. West Indian manatees occasionally enter Louisiana coastal waters and streams during the warmer months (i.e., June through September). During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and state law. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with manatees, although passively taking pictures or video would be acceptable. For more detail on avoiding contact with manatees refer to the Endangered and Threatened Species section of this document or contact this office.

Response 3 – Concur. CEMVN will implement appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees will also be included in the contract specifications.

4. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of project features and timing of construction. During project construction, a qualified biologist should inspect the proposed construction site for the presence of documented and undocumented wading bird nesting colonies and bald eagles.

    a. All construction activity during the wading bird nesting season (February through October 31 for wading bird nesting colonies, exact dates may vary) should be restricted within 1,000 feet of a wading bird colony. If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the USACE should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies.
    b. During construction activities, if a bald eagle nest is within or adjacent to the proposed project footprint, the applicant should follow the bald and golden eagle guidelines found on-line here to determine whether disturbance will occur and/or an incidental take permit is needed.

Response 4 – Concur. The bald eagle was removed from the list of Endangered and Threatened Species in August 2007 but continues to be protect under the BGEPA and the MBTA. During nesting season, construction must take place outside of the USFWS/LDWF buffer zones. Additionally, the project area is located in habitats which are commonly inhabited by colonial

nesting waterbirds and/or seabirds. The following conservations measures will be implemented to minimize disturbance to colonial nesting birds:

1. For colonies containing nesting brown pelicans, all activity occurring within 2,000 feet of a rookery should be restricted to the non-nesting period (i.e. September 15 through March 31). Nesting periods may vary considerably among Louisiana's brown pelican colonies, however, so it is possible that this activity window could be altered based upon the dynamics of the individual colony. Brown pelicans are known to nest on barrier islands and the other coastal islands in St. Bernard, Plaquemines, Jefferson, Lafourche, and Terrebonne Parishes, and on Rabbit Island in lower Calcasieu Lake, in Cameron Parish.

2. For colonies containing nesting wading birds (i.e. herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a rookery should be restricted to the non-nesting period (i.e., September 1 through February 15, exact dates may vary within this window depending on species present).

3. For colonies containing nesting gulls, terns, and/or black skimmers, all activity occurring within 650 feet of a rookery should be restricted to the non-nesting period (i.e., September 16 through April 1, exact dates may vary within the window depending on species present).

In addition, on-site contract personnel including project-designated inspectors will be trained to identify colonial nesting birds and their nests and avoid affecting them during the breeding season (i.e., the time period outside the activity window). Should on-site contractors and inspectors observe potential nesting activity, coordination with the LDWF and USFWS will be needed.

The Service recommends that the USACE contact the Service and the NMFS for additional ESA section 7 consultation if: 1) the scope or location of the proposed Project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat, 3) the action is modified in a manner that causes effects to listed species or designated critical habitat, or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in this consultation should occur before changes are made or finalized.

Decision: The USACE has evaluated the environmental impacts of the proposed action in EA #589. While unavoidable impacts would occur due to project actions within Neptune Pass and Quarantine Bay, the proposed action would result in the elimination of the present navigational threat within the river. In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The strong currents flowing through Neptune Pass are also resulting in reports of deep draft vessels experiencing suction, created by the large amount of water flowing through Neptune Pass, as these vessels transit the adjacent segment of the Mississippi River. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river and the segment of the Mississippi River from Baton Rouge to the

Gulf of America supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed. Based on this assessment and the review by my staff, it is my determination that the proposed action would have no significant impact on the environment. Therefore, an Environmental Impact Statement will not be prepared.

15-04-25
Date

C. A. Jones
CULLEN A. JONES, P.E., PMP
Colonel, U.S. Army
District Commander

ENVIRONMENTAL ASSESSMENT

MISSISSIPPI RIVER, BATON ROUGE TO THE GULF OF MEXICO, LOUISIANA

NEPTUNE PASS ROCK CLOSURE

PLAQUEMINES PARISH, LOUISIANA

EA #589

April 2025

U.S. Army Corps of Engineers
Mississippi Valley Division
Regional Planning and Environment Division South
New Orleans District

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1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South, has prepared this Environmental Assessment (EA) to evaluate the potential impacts associated with constructing flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana. In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed further in this revised EA.

In August 2024, USACE released a revised Draft EA #589 to address design updates since September 2022 and associated FONSI initiating the 30-day public and agency review period (August 2, 2024 to September 3, 2024). During the public review period, USACE received letters of support as well as critical feedback from both the public and non-governmental organizations regarding the proposed action, specifically the design of the Neptune Pass Flow Reduction Structures (Inlet and Outlet structures)[1]. In response to requests for additional modeling information associated with the Inlet and Outlet structures, USACE released the draft November 2023 Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure[2], prepared by the USACE, Engineering Division, Hydrology, Hydraulics, and Coastal Engineering Branch and Lower Mississippi River and Tributaries Engineering Branch. At that time, the proposed project was still in the Engineering and Design Phase for both the Inlet Structure and Outlet structures. More specifically, USACE was in the Geotechnical Design Phase and actively incorporating geotechnical information into the design of the project features. In December 2024, USACE completed the Geotechnical Design Phase and has since refined the proposed action. The proposed action design changes from the August 2024 draft to this final EA #589 are described in *Section 1.1 Revised Proposed Action*.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation ER 200-2-2. This EA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander, USACE, New Orleans District (CEMVN), to make an informed decision on the appropriateness of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

[1] Refer to Appendix B – Public Comments and Responses.
[2] Refer to Appendix C – Draft November 2023 Neptune Pass Model Report.

1.1 Revised Proposed Action

Neptune Pass Flow Reduction Structures
(All elevations referenced for the proposed action structures are to North American Vertical Datum 1988 (NAVD88) (epoch 2004.65), unless otherwise noted).

The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of America from continuing to grow. The proposed action comprises two features that would work together to provide a sustainable solution to remove the hazard. There would be stone placed to raise the existing riverbank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There would be Sediment Retention Enhancement Devices (SREDs) built with earthen material excavated from adjacent mud-bottoms, as well as placement of geotextile fabric and stone riprap. The SREDs would be constructed at the outlet of Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features would be placed in navigable water.

Based upon geotechnical analysis completed in December 2024, USACE determined that a phased construction approach of the inlet and outlet structures was warranted to further assess the real time effects on Navigation during periods of high river flow and to be able to plan efficient and cost effective follow up actions, as needed. The proposed phased construction and real time monitoring approach would include the following:

- Phase 1 - construction of a modified, less restrictive stone inlet structure at the at the entrance of Neptune Pass that is similar to the proposed structure as described in draft EA #589.
- If warranted, Phase 2 - raise the Phase 1 stone structure to further reduce the cross-sectional area of the entrance of Neptune Pass.
- If warranted, Phase 3 - construct the outlet structures (i.e., Sediment Retention Enhancement Devices (SREDs)) in a modified configuration. The SREDs would be designed to increase the elevations in Quarantine Bay at the outlet of Neptune Pass to back up the flow and decrease the flow capacity. The SREDs would consist of dredged material, stone, geotextile, wooden piles, or a combination of these options.
- Upon completion of each phase of construction, multibeam surveys and flow measurements will be conducted routinely to assess the effects to bathymetry and flow in Neptune Pass and the Mississippi River. Post construction of the inlet structure, USACE will engage with the navigation industry to determine any positive or negative real time effects on navigation.

The modeled flow after Phase 1 construction of the revised design inlet structure is expected to be approximately 125,000 cubic feet per second (cfs) at a Mississippi River flow of 1 million cfs. If Phase 2 and Phase 3 are constructed, once those features are complete, the target flow is expected to be approximately 80,000 cfs at a Mississippi River flow of 1 million cfs. Figure 1 shows the project area with inlet and outlet structures.[3]

[3] Draft EA #589 - The target flow of original inlet structure was approximately 80,000 cfs at a Mississippi River flow of 1 million cfs.

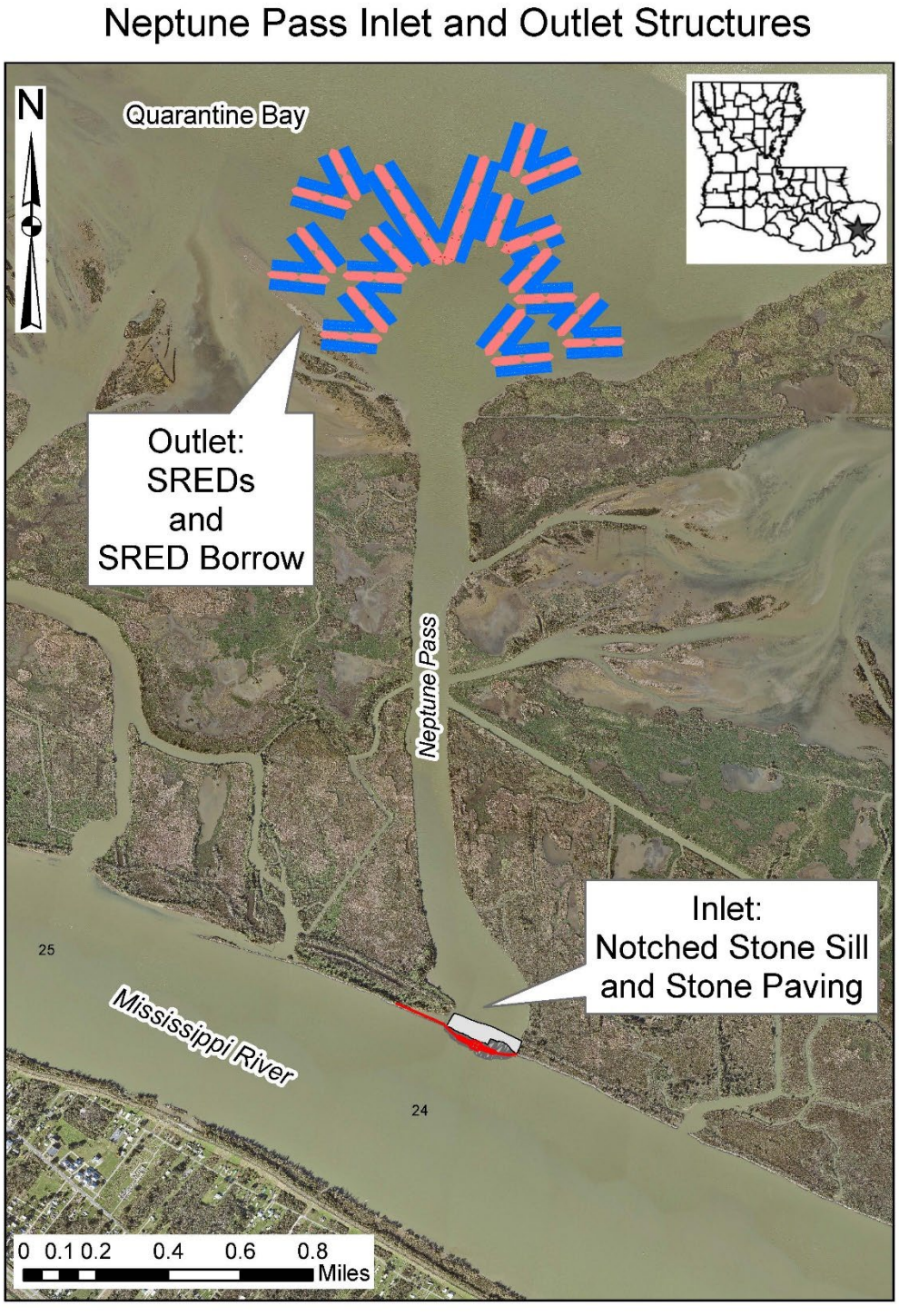

Figure 1. Project vicinity map and features

Inlet Structure – Revised Design[4]

The proposed Neptune Pass Inlet Structure is a stone sill that would reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure would begin with a tie in at the end of the Mississippi River foreshore dike on the upstream side of the Neptune Pass inlet and would end with a tie in at the end of the Mississippi River foreshore dike on the downstream side of the Neptune Pass inlet. The revised design of the structure includes varying extension distances, crown elevations, crown widths, river side slopes, and land side slopes along the alignment. The structure alignment would be shifted slightly riverward, side slopes of the structure would be shallower, and there would be an overall reduction in area of the stone paving on the pass side of the structure. Based on geotechnical borings and analysis, shallower slopes and slight shift in alignment are needed to achieve acceptable factors of safety. The elevation crown notch would be shifted downstream to the narrower part of the existing bank line ridge with an elevation of -26 feet. The crown elevation would be -8 feet extending toward both banks, replacing areas that were previously at a +5 feet elevation (i.e., inlet structure original design). The cross-sectional area at the inlet to Neptune Pass has increased from 7,200 square feet to 10,300 square feet for Phase 1. There would be an elevation transition slope of 1 vertical on 2 horizontal (1V:2H) between the design elevations. The structure would cover approximately 331,700 square feet and be constructed with approximately 330,200 tons of stone. A 3-foot-thick layer of stone paving scour protection would cover approximately 42,700 square feet requiring approximately 7,700 tons of stone and would be placed approximately 325 feet into the pass from the crown of the structure. The alignment and design are listed below in Table 1. Figure 2 shows the revised design inlet structure feature. Figure 3 shows a side scan rendition of the revised design inlet structure.

Table 1. Revised Design Inlet Structure Specifications.

Feature Length (ft)[5]	Crown Elevation (ft)	Crown Width (ft)	River Side Slope (V:H)	Land Side Slope (V:H)
195	+5	5	1:2	1:3
272	-8	50	1:2.5	1:2.5
148	-8	50	1:3	1:2.5
91	-26	115	1:2	1:2
143	-8	50	1:3	1:3
101	+5	5	1:2	1:3

[4] Draft EA #589 – Inlet Structure original design:

- Center of the structure – 100-foot-wide notch at an elevation of -26 feet and a 115-foot-wide crown.
- Side slopes adjacent to center notch – 1V:2H slope to an elevation of -8 feet and a 50-foot-wide crown extending 170 feet upstream and downstream.
- Structure side slopes – 1V:2H slope to an elevation of +5 feet and a 5-foot-wide crown tying into the upstream and downstream Mississippi River bank.
- Existing foreshore dike – capped with stone to match the tie in elevation of +5 feet.
- Inlet structure – tie into existing ground at a 1V:1.75H slope perpendicular to the Mississippi River bank.
- Inlet cross sectional area – reduced to approximately 7,200 square feet.
- Structure – constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds.
- Stone Paving scour protection – 3-foot-thick layer of approximately 20,000 tons of 1,200-pound stone placed approximately 325 feet into the pass from the crown of the structure.

[5] The feature length is the extension distance at a constant design template between the 1V:2H sloping transitions between the elevation changes.

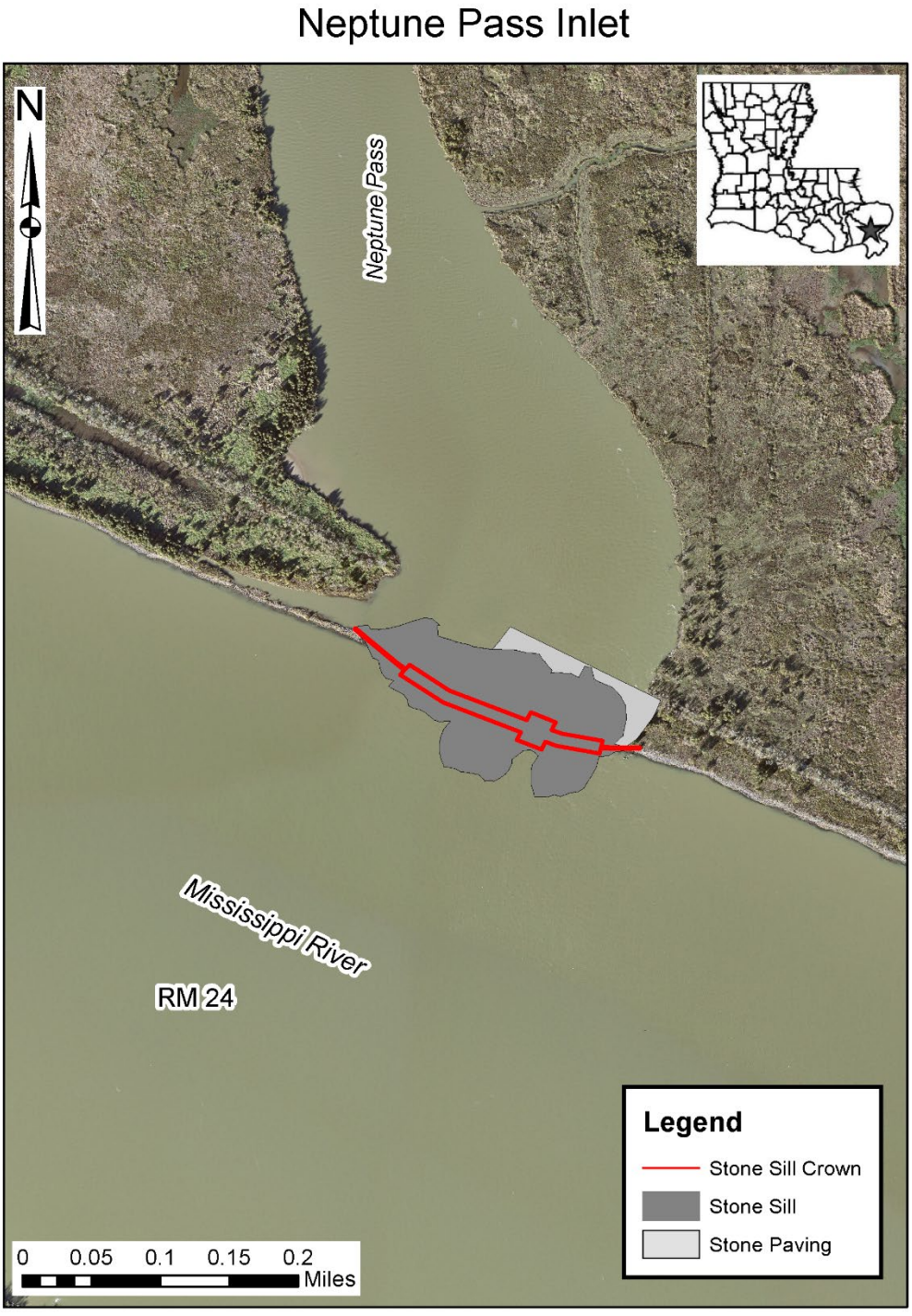

Figure 2. Inlet Structure – Revised Design.

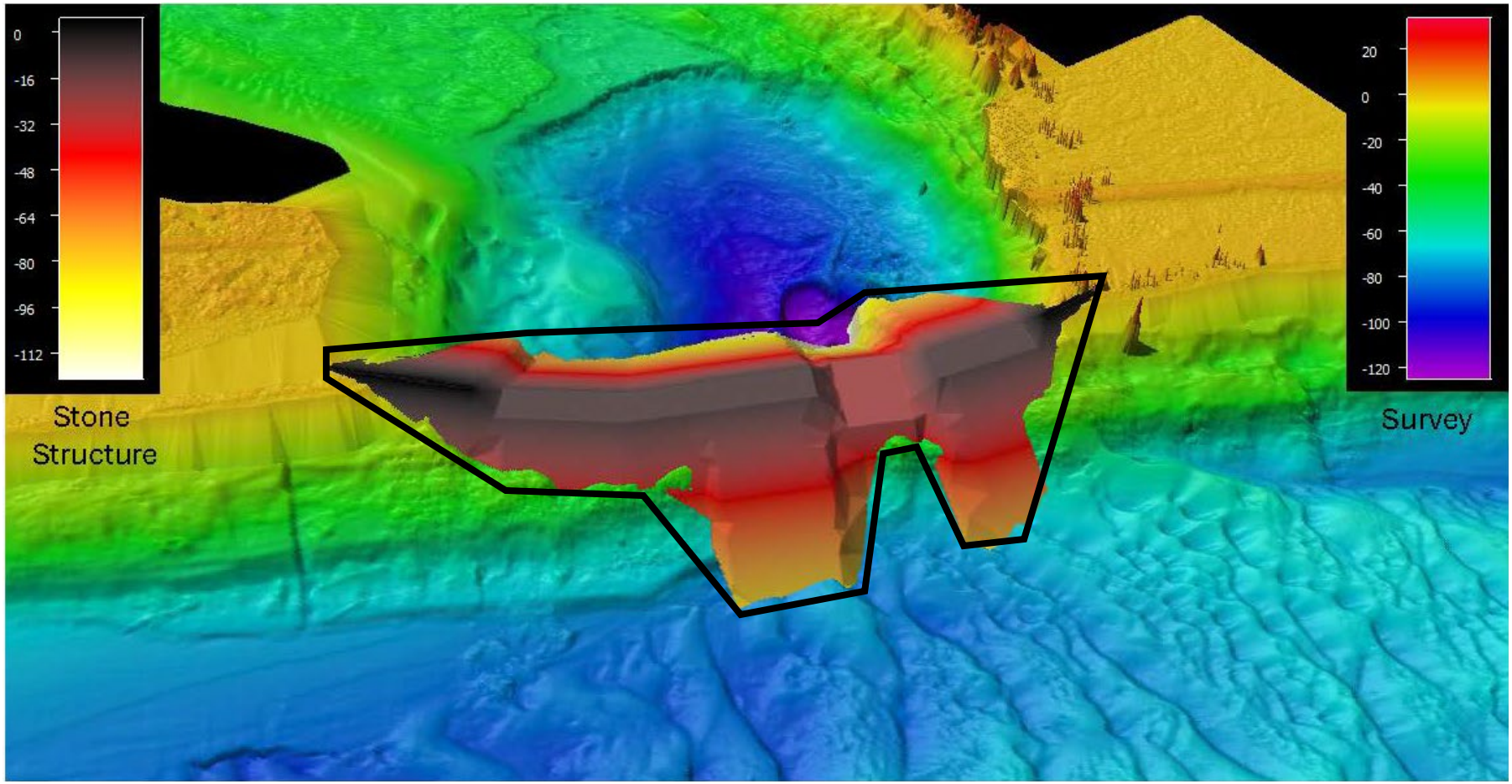

Figure 3. Side scan rendition of Inlet Stone Sill – Revised Design (limits delineated by black polygon outline).

Outlet Structures

The proposed Neptune Pass Outlet Structures would consist of multiple armored V-shaped SREDs placed between the -6 and -10-foot contour. Barge mounted excavators would be utilized to excavate earthen material from adjacent mud-bottoms and side cast material to create each SRED. It is expected that a total of approximately 520,000 cubic yards of earthen material would be required for construction of the SREDs. The SREDs would have a five-foot top width and would be constructed to a target elevation of +5.0 feet, with side slopes of 1V:2H. Each SRED would consist of multiple terraces that are 300 feet long with 100-foot gaps between each terrace. The SREDs would also require placement of approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile. All work would be via floating plant. Placement of stone would be via barge mounted excavator or dragline. Figure 4 shows the outlet structure features (SREDs). Figure 5 shows a rendition of the approximate proposed location of the outlet structures (SREDs).

1.2 Authority for the Proposed Action

The project, "Mississippi River, Louisiana, Between Baton Rouge and New Orleans" was authorized by the River and Harbor Act of 1925, in accordance with the report of the Chief of Engineers published as House Document Number 105, 69th Congress. The project, "Mississippi River at and near New Orleans, Louisiana was authorized by the River and Harbor Act of 1937 in accordance with the report of the Chief of Engineers published as House Document 597, 75th Congress. The project, Mississippi River, Baton Rouge to the Gulf of Mexico, was authorized by Section 2 of the River and Harbor Act of 1945 (PL 79-14) in accordance with the report of the Chief of Engineers in House Document No 215 of the 76th Congress, and by the River and Harbor Act of 1962 in accordance with the report of the Chief of Engineers in Senate Document No. 36 of the 87th Congress. The project, "Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana" was authorized by the Supplemental Appropriations Act of 1985 and by Section 201 of the Water Resources Development Act of 1986, both in accordance with the Report of the Chief of Engineers dated April 9, 1983.

1.3 Purpose and Need for the Proposed Action

The purpose of the proposed action is to eliminate a navigational hazard in the Mississippi River. Neptune Pass is a natural crevasse which existed prior to 1985 but has increased significantly in size and flow during recent annual high river events, with a noticeable enlargement after 2019. This newly enlarged pass is diverting approximately eight times more water than the other five adjacent outlets combined in this 3-mile reach of the Mississippi River. In an effort to best reduce sedimentation within the Mississippi River attributed to the expansion of Neptune Pass, the location and dimensions of the proposed action were designed to approximately match the outlet before the riverside bank protection failed and the pass was allowed to develop. Approximately 16% of the Mississippi River is currently being diverted through Neptune Pass. Once construction of the Neptune Pass control structure is complete, diverted flow through the pass should be reduced to 6% of river flow, which is the historical flow rate prior to expansion of Neptune Pass in 2019. However, flow through the pass will vary according to river stage within the vicinity of the project (USACE 2023).

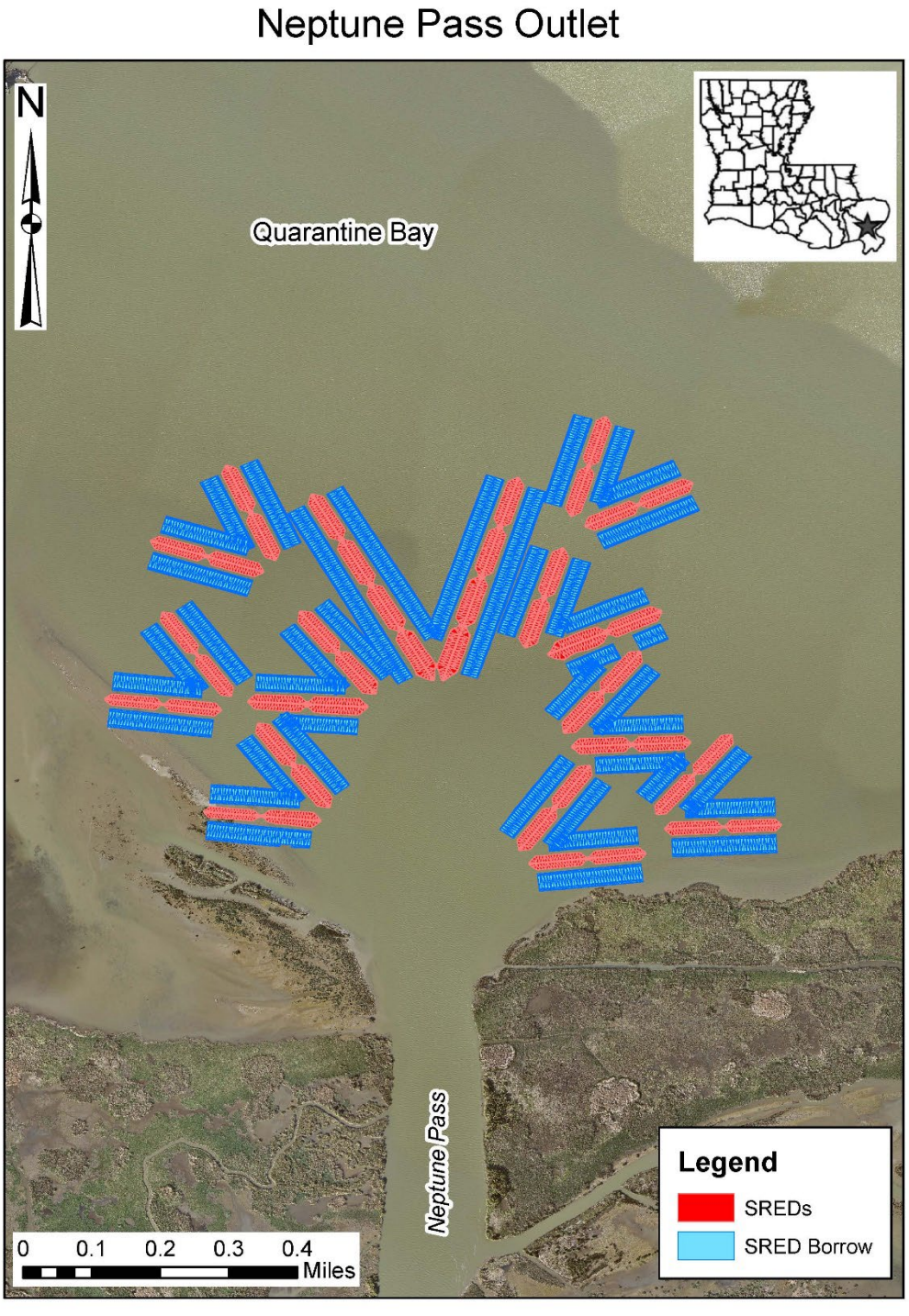

Figure 4. Outlet Structures features.

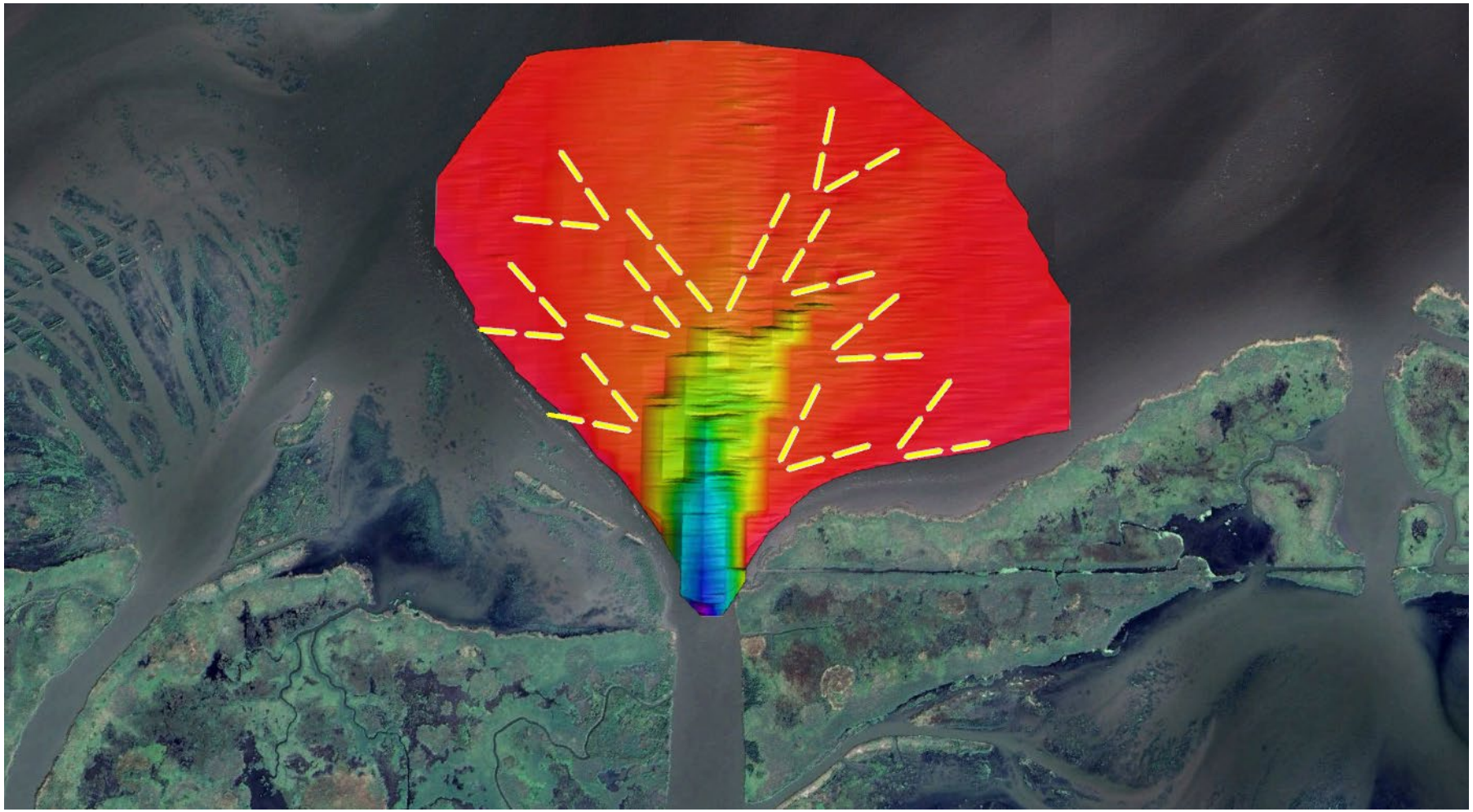

Figure 5. Rendition of approximate location(s) and V-shaped design of Outlet SREDS in Quarantine Bay.

Construction of flow control features within Neptune Pass (inlet structure) and Quarantine Bay (outlet structures – SREDs) would decrease riverbank scour and erosion within the Pass and control water flow being diverted from the Mississippi River. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths. In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling within the river. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The large amount of water flowing through Neptune Pass is also resulting in reports by river pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river, and the segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

1.4 Prior NEPA Documents

The environmental impacts associated with maintaining channels, outlets, and specified dimensions of the Mississippi River from Baton Rouge, Louisiana to deep water in the Gulf of America were addressed in the Final Environmental Impact Statement (EIS), “Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana”. A Statement of Findings (SOF) for this EIS was signed on February 15, 1974. The project commences at the Port of Baton Rouge, 128.6 miles above the Port of New Orleans, and continues through the Port of New Orleans to about 94.5 miles south to the Head of Passes. Below the Head of Passes, two channels, Southwest Pass and South Pass, connect to the Gulf of America.

Supplement I to the 1974 EIS addressed unintentional omissions in the original EIS and unanticipated changes in dredging requirements. A SOF for Supplement I was signed on March 8, 1976.

Supplement II to the 1974 EIS addressed the addition of recommended features to the existing project to reduce the amount of maintenance dredging required to maintain navigation within the project area. A SOF was signed for Supplement II on May 15, 1985.

The “Integrated General Reevaluation Report & Supplement III to the Final Environmental Impact Statement, Mississippi River Ship Channel, Baton Rouge to the Gulf of Mexico, Louisiana” addressed navigation improvements for deep draft navigation access to ports located along the Mississippi River in southeast Louisiana. A Record of Decision (ROD) was signed for Supplement III on August 3, 2018.

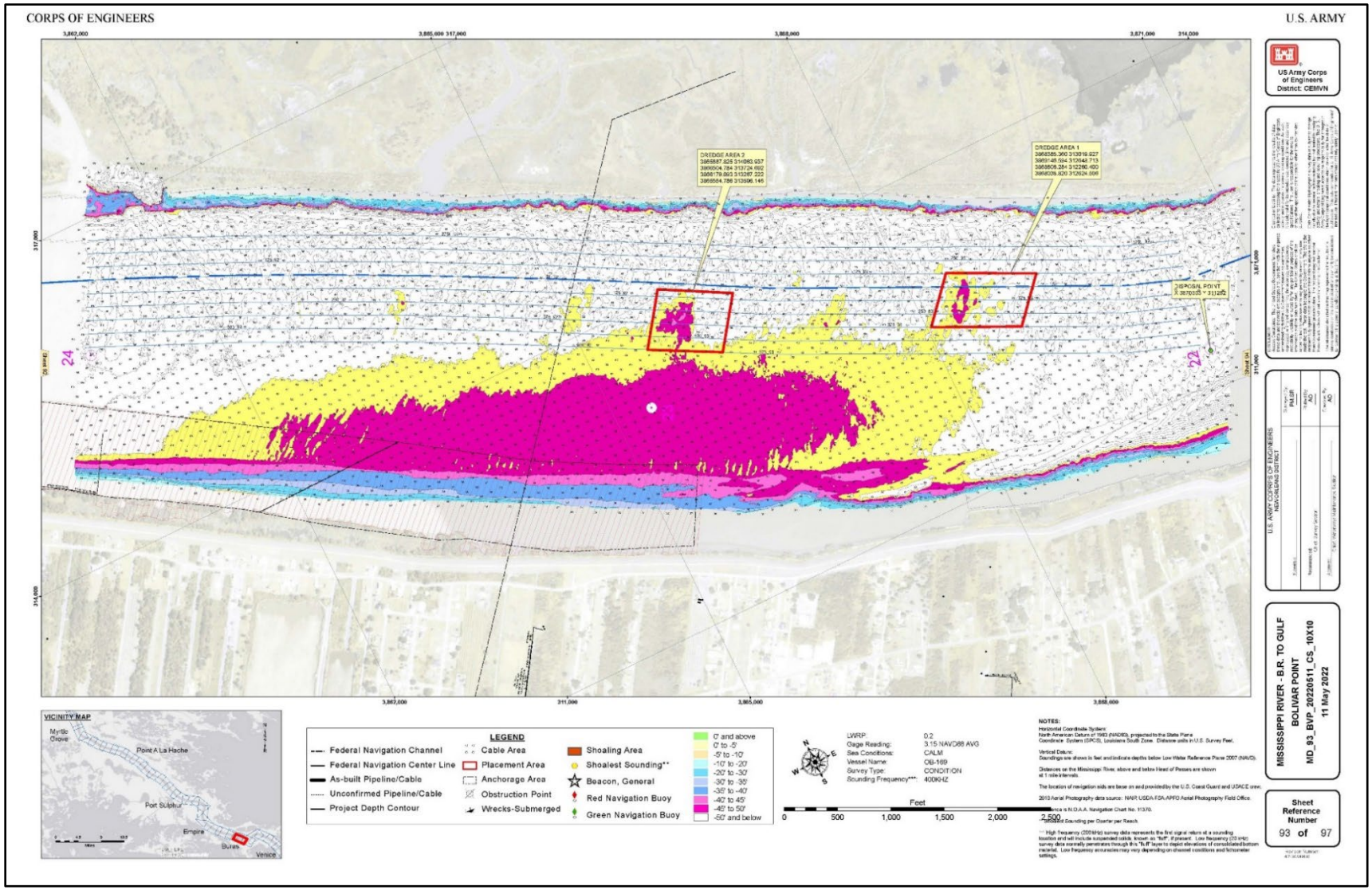

Figure 6. Shoaling occurring within the Mississippi River attributed to the expansion of Neptune Pass.

EA #595, Neptune Pass Emergency Armoring, Plaquemines Parish, Louisiana, addressed potential impacts associated with emergency construction of a stone revetment structure along the eastern bank of the mouth of Neptune Pass, adjacent to Mississippi River mile 23.9, in Plaquemines Parish, Louisiana. The emergency action required placement of approximately 58,000 tons of stone by barge mounted equipment positioned both within the Pass and Mississippi River to stabilize the rapidly eroding eastern bank of the mouth of Neptune Pass. The stone was placed in open water and no wetlands within the area were impacted by the action. The project area is approximately 8 acres of open water located along the eastern bank of the mouth of Neptune Pass. Construction of the stone revetment structure was completed on June 3, 2023. A FONSI was signed for EA #595 on March 13, 2024.

1.5 Public Concerns

Localized accretion has been observed within adjacent bays to Neptune Pass. Louisiana accounts for 80% of the continental United States' coastal wetland loss (Williams et al. 1997), and some public support exists for allowing Neptune Pass to remain open and unmodified to promote land gain and potential wetland establishment within these areas.

While additional studies would provide clarification regarding the potential land building capabilities of the diversion, the purpose and need for the proposed project is the elimination of the navigational hazard present within the Mississippi River. There is no current authority in this project for USACE to thoroughly study the marsh creation potential of leaving the pass open. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths. Additionally, the large amount of water flowing through Neptune Pass is resulting in reports of pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. The Rivers and Harbors Acts of 1946 and 1962, the Supplemental Appropriations Act of 1985, and the Water Resources Development Act of 1986 (Public Law 99-662) provide for the maintenance of channel dimensions of the Mississippi River from the Gulf of America to Baton Rouge, Louisiana. By this authority, the USACE is authorized and obligated to perform necessary project actions to maintain the prescribed navigational dimensions of the Mississippi River. The segment of the Mississippi River from Baton Rouge to the Gulf of America supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020); therefore, the maintenance of this navigable waterway is vital for local and global supply chains and economies. The existing conditions within the vicinity of Neptune Pass pose a threat to navigation and commercial trade, and the potential expansion of Neptune Pass would further endanger vessels transiting the area in the absence of the proposed action.

2 ALTERNATIVES TO THE PROPOSED ACTION

2.1 No-Action – Future without Project Condition

In the future without project condition (a.k.a. no-action), the proposed action would not be constructed. In the absence of the proposed action, uncontrolled flow would continue to be diverted from the Mississippi River resulting in continued shoaling in the adjacent segment of the river.

Continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the

diversion effects if the proposed action is not completed. Deep draft vessels would continue to experience suction when transiting the Mississippi River adjacent to Neptune Pass, with a potential for an increase in suction as Neptune Pass widens and flow increases. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation.

2.2 Alternatives Considered but Eliminated from Further Evaluation

Alternative 1

Alternative 1 (previous proposed action included in the September 2022 Draft EA #589). This alternative considered the construction of a flow control feature requiring installation of a stone closure structure within Neptune Pass via placement of stones from a barge positioned within the Pass. The structure would be built to an elevation of +5 feet with a 6-foot crown width on a 1V:2H slope perpendicular to the center line with a 100-foot notch constructed at an elevation of -10 feet in the center of the structure. A 2-foot bank paving at the inlet and outlet and 2-foot channel paving at the structure outlet would be constructed as scour protection. Stone key-in of the closure structure would require excavations and extend approximately 150 feet from the top of bank. Approximately 141,000 tons of stone would be placed in an area approximately 4.8 acres in size for construction of the closure structure and bank protection within the Pass. Installation of the key-in segment of the flow control feature would require excavation of approximately 1,500 cubic yards of material and placement of 1,750 tons of stone in approximately 0.4 acres of wetland areas adjacent to the Pass. This alternative received critical feedback from Federal and State agencies, the public, and non-governmental organizations in a September 2022 30-day public review of Draft EA #589. The performance of the formerly proposed structure was analyzed, and findings presented include output from the 800,000 cfs simulation and suggest that the structure would significantly reduce the flow diverted through Neptune Pass but would induce hydraulic conditions that could result in flanking of the structure and/or additional marsh scour. Under high-flow scenarios on the Mississippi River, the sill-notch structure restricted flow through the pass so much that a significant water surface elevation difference across the structure was created. Continued stress under this high-flow scenario could lead to increased marsh scour, pass enlargement, and potential failure of the structure via flanking, further increasing the flow diverted through Neptune Pass. The potential for flanking and marsh erosion associated with the formerly proposed structure under this alternative rendered its implementation infeasible. After undertaking additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay, it was determined that this alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 2

Alternative 2 considered the construction of the structure on the Mississippi Riverbank at the mouth of Neptune Pass. There is an existing stone dike and revetment up and down stream of the proposed location structure to tie into. Construction on the Mississippi Riverbank would be the way to return to the local geometry to pre-existing conditions. However, the large quantity of stone being placed on a relatively narrow sill with existing stability concerns put the structure at risk of failure. Failure could occur from scour continuing to develop behind the structure as the sediment starved water enters the pass. Flanking of the structure on the upstream or downstream limits at the locations where is pass is already expanding is also a possibility. Either of these failure modes would result in redevelopment of existing conditions. Additionally, preliminary

estimates indicate that this alternative would require approximately 211,000 tons of stone to complete, an increase of 70,000 tons of stone from the proposed action. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 3

Alternative 3 considered the construction of a structure without the inclusion of a notch. A full closure would be the most effective means of reducing the shoaling attributed to the expansion of the pass. However, failure resulting from the flanking of the structure on the upstream or downstream limits at locations where the pass is already expanding is a high possibility. Additionally, the 100 feet notch at -10 feet NAVD88 of the proposed action was designed to approximately match this outlet before the bank failed and the pass was allowed to develop. There is the best chance of reducing sedimentation in the Mississippi River by matching the historic stream power at this location to the pre failure conditions. Public concern for maintaining some connectivity from the river to adjacent marsh areas in order to facilitate land gain was also considered in the elimination of a full closure structure design. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 4

Alternative 4 considered the closure of adjacent channels to Neptune Pass to alleviate the shoaling occurring within the Mississippi River. However, the current enlarged outlet through Neptune Pass is diverting approximately four to eight times more water than the five adjacent outlets combined in this three-mile reach of the Mississippi River. Closure of other outlets would not be as effective. Additionally, the shoaling within the Mississippi River adjacent and downstream of the pass was not observed until after the scouring and enlargement of Neptune Pass occurred. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

3 AFFECTED ENVIRONMENT

3.1 Description of Project Area

The proposed project area is located in Plaquemines Parish in southeastern Louisiana. Parish lands occupy part of the active delta of the Mississippi River in a dynamic area dependent upon the disbursement and settlement of river sediments to maintain land elevations above water. The Mississippi River splits into three main channels within the delta region: Pass a Loutre; South Pass; and Southwest Pass. Land elevations range from sea level along the Gulf coast, to approximately +10 feet above sea level along the natural levee ridges. It is a sparsely populated region characterized by river channels with attendant channel banks, natural bayous, and man-made canals interspersed with intermediate and fresh marshes. Water levels fluctuate within the river, passes, estuarine bays, and marshes according to river flow from upstream, tidal, and wind influences.

Within the immediate vicinity of the proposed action, initial stabilization efforts were completed by the USACE following the bank failure and expansion of Neptune Pass. A 90,000-ton stone revetment was placed on the remaining bank line at the confluence of Neptune Pass and the Mississippi River, which was completed on June 3, 2023. This armoring effort was done to prevent the opening of Neptune Pass from widening or deepening beyond its condition at the time of

repair. This effort was completed under the USACE Channel Improvement authority, which authorizes bank stabilization efforts under the Mississippi River and Tributaries Program.

3.2 Description of Watershed

The Mississippi River drains approximately 41% of the 48 contiguous states of the United States. The Mississippi River basin covers more than 1,245,000 square miles, includes all or parts of 31 states and two Canadian provinces. The river roughly resembles a funnel that has its spout at the Gulf of America. Waters from as far east as New York and as far west as Montana contribute to flows in the lower river. The lower alluvial valley of the Mississippi River is a relatively flat plain of about 35,000 square miles bordering on the river which would be overflowed during times of high water if it were not for man-made protective works. This valley begins just below Cape Girardeau, Missouri, is roughly 600 miles in length, varies in width from 25 to 125 miles, and includes parts of seven states—Missouri, Illinois, Tennessee, Kentucky, Arkansas, Mississippi, and Louisiana. The Mississippi River is the mainstem of the world's most highly developed waterway system, about 12,350 miles in length. Discharge at Baton Rouge ranges from 1,500,000 cubic feet per second (cfs) once every 16 years, on average, to a low of 75,000 cfs recorded once during the period 1930 to the present, and average annual discharge is 450,000 cfs. Southwest Pass of the Mississippi River discharges roughly one-third of the river's total flow, with an average rate of about 145,000 cfs. South Pass of the Mississippi River discharges roughly one-sixth of the river's total flow, averaging about 78,000 cfs. Pass a Loutre of the Mississippi River discharges almost one-third of the river's total flow or slightly less than the Southwest Pass flow. The average discharge rate through Pass a Loutre is just under 145,000 cfs. The combined discharge of Southwest Pass, South Pass, and Pass a Loutre is approximately 80% of the total river flow into the Gulf of America. The remaining flow is distributed through minor passes upstream of Head of Passes.

3.3 Climate

The project area climate is humid, subtropical with a strong maritime character. Warm, moist southeasterly winds from the Gulf of America prevail throughout most of the year, with occasional cool, dry fronts dominated by northeast high-pressure systems. The influx of cold air occurs less frequently in autumn and only rarely in summer. Tropical storms and hurricanes are likely to affect the area three out of every ten years, with severe storm damage approximately once every two or three decades. The majority of these occur between early June and November. Summer thunderstorms are common and tornadoes strike occasionally. Average annual temperature from the Boothville-Venice climate monitoring station (1981 to 2010 NOAA dataset) is around 70°F, with average temperatures ranging from 82.9°F in July and August to 54.3°F in January. Average annual precipitation is 59.4 inches, varying from a monthly average of 7.5 inches in August, to an average of 2.8 inches in May.

3.4 Geology

The Mississippi River Delta complex was formed by river deposits between 700 and 7,400 years ago. The Natural Resources Conservation Service (NRCS) classifies soils within the proposed project area as mucks and clays mixed with organic matter, and silts derived from river deposits. The soil composition is subject to change as floodwaters and storm surges deposit sediment. Soil types in the project area are predominantly Gentilly, Clovelly, and Larose. These soils are classified as continuously flooded deep, poorly drained and permeable mineral clays and mucky clays. Marsh and swamp deposits are found in the vicinity of the river from New Orleans to the

Heads of Passes at the Gulf of America. Marsh deposits are primarily organic, consisting of 60% or more by volume of peat and other organic material with the remainder being a composition of various types of clays. Total organic thickness is normally 10 feet, with variances less than one foot. Inland swamp deposits are composed of approximately 70% clay and 30% peat and organic materials. The percentage of sand and sandy silts increases with proximity to the open waters of the Gulf of America (USACE 1974).

3.5 Relevant Resources

This section contains a description of relevant resources that could be impacted by the project. The important resources described are those recognized by laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Table 2 provides summary information of the institutional, technical, and public importance of these resources.

A wide selection of resources were initially considered and determined not to be affected by the project—mainly due to the remote and uninhabited nature of the project area and general lack of significant populated areas in the vicinity. Recreational activities, aesthetic visuals, and socioeconomic resources, including land use, population, transportation, oil and gas, environmental health and safety, community cohesion, desirable community growth, tax revenues, property values, public facilities and services, business activity and employment, and displacement of people would not be affected by the proposed project. The objectives of Executive Order 11988 (Floodplain Management) were considered; however, CEMVN has determined that floodplain impacts, if any, from the proposed action would be negligible. Additionally, there is no practicable alternative for project construction outside the 100-year floodplain. No prime or unique farmlands, as defined and protected by the Farmland Protection Policy Act, would be affected by the proposed project. No portion of the project area has been designated a Louisiana Natural and Scenic River; therefore, a Scenic Rivers permit is not warranted.

Table 2. Relevant resources and their institutional, technical, and public importance.

Resource	Institutionally Important	Technically Important	Publicly Important
Navigation	Rivers and Harbors Act of 1899 and River and Harbor Flood Control Act of 1970 (PL 91-611).	USACE provides safe, reliable, efficient, and environmentally sustainable waterborne transportation systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation.	Navigation concerns affect the area's economy and are of significant interest to the community.
Aquatic Resources/ Fisheries	Fish and Wildlife Coordination Act of 1958, as amended; Clean Water Act of 1977, as amended; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968.	They are a critical element of many valuable freshwater and marine habitats; they are an indicator of the health of the various freshwater and marine habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Wetlands	Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968., EO 11988, and Fish and Wildlife Coordination Act.	They provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities.	The high value the public places on the functions and values that wetlands provide. Environmental organizations and the public support the preservation of marshes.

Resource	Institutionally Important	Technically Important	Publicly Important
Essential Fish Habitat (EFH)	Magnuson-Stevens Fishery Conservation and Management Act of 1996, Public Law 104-297.	Federal and state agencies recognize the value of EFH. The act states, EFH is "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."	The public places a high value on seafood and the recreational and commercial opportunities EFH provides.
Wildlife	Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918.	They are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Threatened or Endangered Species	The Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940.	USACE, USFWS, NMFS, NRCS, EPA, LDWF, and LDNR cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem.	The public supports the preservation of rare or declining species and their habitats.
Cultural Resources	National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979.	State and federal agencies document and protect sites. Their association or linkage to past events, to historically important persons, and to design and construction values; and for their ability to yield important information about prehistory and history.	Preservation groups and private individuals support protection and enhancement of historical resources.
Tribal Resources	The requirement to conduct coordination and consultation with federally recognized tribes finds its basis in the constitution; supreme court cases; EO 13175: consultation and coordination with Indian Tribal Governments; and USACE Tribal Consultation Policy, 2012.	USACE consults with federally recognized tribes to determine if tribal rights, tribal lands, or protected tribal resources, would be significantly adversely affected by a proposed action.	Tribal governments and the public-at-large support the recognition of tribal lands, resources, and protected tribal resources.
Air Quality	Clean Air Act of 1963, Louisiana Environmental Quality Act of 1983.	State and federal agencies recognize the status of ambient air quality in relation to the NAAQS.	Virtually all citizens express a desire for clean air.
Water and Sediment Quality	Clean Water Act of 1977, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, and Louisiana State & Local Coastal Resources Act of 1978.	USACE, USFWS, NMFS, NRCS, EPA, and State DNR and wildlife/fishery offices recognize the value of fisheries and good water quality and the national and state standards established to assess water quality.	Environmental organizations and the public support the preservation of water quality, fishery resources, and the desire for clean drinking water.

3.5.1 Navigation

Existing Conditions

The uncontrolled flow being diverted through Neptune Pass is resulting in shoaling within the adjacent, downstream segment of the Mississippi River. Additionally, due to the large volume of water flowing through the diversion, deep draft vessels are experiencing suction effects as these vessels transit the section of the River adjacent to Neptune Pass. The Mississippi River provides deep-draft access to the New Orleans – Baton Rouge port corridor and its associated commerce and industries. Continued maintenance of the current dimensions of the Mississippi River and its passes are vital to the continued growth and health of the industries and commerce they serve.

3.5.2 Aquatic Resources / Fisheries

Existing Conditions

The estuarine nature of the area provides a dynamic aquatic environment where freshwater and saltwater meet, creating a transitional zone between the two aquatic ecosystems. The marshes

and waterways provide important spawning and nursery habitat and a food source for a wide variety of fresh and saltwater fish species. Vegetation and marsh loss degrades the utility of the area as nursery habitat and a food source for fisheries.

The influx of freshwater from the Mississippi River, particularly during floods and other high water flow periods, potentially allows for riverine fisheries species to migrate downriver to the delta region. The USFWS published Habitat Suitability Index (HSI) Models in 1982 and 1983, which included salinity tolerances for a variety of freshwater fisheries. Potential species that could occur during high water/low salinity periods include channel catfish, blue catfish, flathead catfish, smallmouth bass, largemouth bass, black crappie, white crappie, sunfish, gizzard shad, and smallmouth buffalo among others.

During low water periods, storm surges, and seasonally strong tidal influences, the increased saltwater intrusion from the Gulf restricts the abundance and diversity of freshwater fisheries, as well as provides opportunities for estuarine (brackish) species. Many of these species are economically and recreationally important, including red drum, black drum, spotted sea trout, sand seatrout, striped mullet, Gulf menhaden, Atlantic croaker, sheepshead, southern flounder, Spanish mackerel, southern kingfish, and spot. Commercially important shellfish found include blue crab, brown shrimp, pink shrimp, white shrimp, and oysters. Other commercially less important species include grass shrimp, mysid shrimp, roughneck shrimp, and mud crab.

The project area also supports populations of phytoplankton and zooplankton (e.g., copepods, rotifers, fish larvae, and molluscan and crustacean larvae). Benthic invertebrate populations are comprised of both epifaunal and infaunal species (e.g., polychaete and oligochaete worms, crustaceans, bivalves, and gastropod mollusks). These organisms constitute vital components of the aquatic food chain and may comprise the diets of numerous finfish and shellfish species.

3.5.3 Wetlands

Existing Conditions

Wetlands in the vicinity of the project area are classified as tidal, fresh to intermediate, emergent marsh. These wetlands are strongly influenced by freshwater discharges from the Mississippi River and associated distributary outlets. Mean annual salinity, acquired from environmental data collection stations of the Coastal Protection and Restoration Authority's (CPRA) Coastwide Reference Monitoring System (CRMS), within wetlands adjacent to the project range from 0.65 ppt at CRMS0118 and 0.56 ppt at CRMS0139 (CPRA 2022).

Common reed (*Phragmites australis*), also known as Roseau cane, occurs in expansive monotypic clumps (monoculture) in shallow water areas near the project site and has displaced a variety of freshwater vascular plant species that have historically occupied the area. This could have been caused by periodic storms generating extremely high saltwater tides, killing off a majority of the sensitive freshwater vegetation (Hauber et al. 1991). Other common species found in the vicinity of the project include alligator weed (*Alternanthera philoxeroides*), cattail (*Typha spp*.), bulltongue (*Sagittaria lancifolia*), broadleaf arrowhead (*Sagittaria latifolia*), dotted smartweed (*Polygonum punctatum*), softstem bulrush (*Schoenoplectus tabernaemontani*), chairmaker's bulrush (*Schoenoplectus* americanus), giant cutgrass (*Zizaniopsis miliacea*) and elephant ear (*Colocasia esculenta*).

Various natural and anthropogenic factors have resulted in a wetland loss of 24 square miles per year on the Louisiana coast over the 10-year period from 1990 to 2000 (Barras et al., 2003). Wetlands within Plaquemines Parish have undergone substantial loss due to subsidence, sea-level rise, and salt-water intrusion. The current trend of wetlands loss was compounded by hurricanes in 2005. A U.S. Geological Survey (USGS) summary of wetland changes, released in February 2006, estimated that 98 square miles of wetlands were converted to open water in southeastern Louisiana (USGS 2006). Far greater loss resulted from Katrina than from Rita, and its impacts were concentrated south and east of New Orleans, with almost half the total loss occurring in Plaquemines Parish (Zinn 2006). Overall marsh loss (i.e., conversion to open water) resulting from Katrina and Rita throughout the entire Mississippi Deltaic Plain of southeastern Louisiana was as follows: fresh marsh—22 square miles; intermediate marsh—49 square miles; brackish marsh—18 square miles; salt marsh—27 square miles (USGS 2006).

In response to wetland loss within Plaquemines Parish, projects involving multiple cooperating agencies and organizations, both public and private, have been proposed and constructed within the Parish. In the vicinity of the proposed Neptune Pass Rock Closure, the "Bay Denesse Restoration Project", a $1.2-million project involving the partnerships of Ducks Unlimited, Coastal Protection and Restoration Authority, National Wildlife Federation, Cajun Fishing Adventures, Chevron, Phillips 66, North American Wetlands Conservation Council, and Gulf Coast Initiative sponsors, is attempting to restore and enhance 2,500 acres of severely deteriorated coastal marsh. To achieve these restoration goals, marsh terraces and crevasses were constructed to optimize sediment capture from the remaining connections to the Mississippi River. These terraces and crevasses would promote the conversion of the present open water habitats within Bay Denesse into mud flats, ponds, submerged aquatic vegetation beds, and emergent marsh.

In conjunction with this project and in partnership with the Water Institute of the Gulf, the "Bay Denesse Living Lab Initiative" involves the construction of a landscape-scale laboratory within Bay Denesse in order to perform and monitor controlled restoration technique experiments. The ability to conduct these landscape-scale experiments would allow for refinement of restoration techniques to determine the most effective means of restoring, enhancing, and conserving wetlands within coastal Louisiana. Additionally, the "Delta Management at Fort St. Philip Project (BS-11)", a Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) outfall management and sediment trapping project, was completed in 2006 in an area of approximately 1,305 acres of marsh and open water habitat east of Bay Denesse. This project, sponsored by USFWS and CPRA, included the construction of terraces with plantings and six crevasses to enhance the natural marsh-building processes and increase the growth rate of emergent wetlands.

3.5.4 Essential Fish Habitat

Existing Conditions

All of the marine and estuarine waters of the northern Gulf of America have been designated as Essential Fish Habitat (EFH). In the northern Gulf of America, EFH has generally been defined as areas where individual life-stages of specific federally managed species are common, abundant or highly abundant. In estuarine areas, EFH is defined as all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities, including the sub-tidal vegetation (seagrasses and algae), and adjacent inter-tidal vegetation (marshes and mangroves). The open waters, water-bottom substrates, and inter-tidal marshes of the Neptune Pass Rock

Closure project area are considered EFH under the estuarine component. Specific categories of EFH include all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities), including subtidal vegetation (sea grasses and algae) and adjacent intertidal wetland vegetation (marshes and mangroves). In addition, estuarine aquatic habitats provide nursery and foraging areas that support economically important marine fishery species that may serve as prey for federally-managed fish species such as mackerels, snappers, groupers, billfishes, and sharks. The estuarine waters in the proposed project area include EFH for several federally-managed species (Table 3). These species use the area for foraging and nursery habitat, as well as a migration route to other areas considered to be EFH. Specific categories of EFH in the project area include estuarine emergent wetlands, mud/sand substrates, and estuarine water column.

Table 3. EFH species in the project area.

Common Name	Life Stage	EFH
brown shrimp	postlarvae	water column associated
brown shrimp	juveniles	Submerged aquatic vegetation; emergent marsh; oyster reef; soft bottom; sand/shell
brown shrimp	subadults	soft bottom; sand/shell
pink shrimp	juveniles	submerged aquatic vegetation; soft bottom; sand/shell; mangroves; oyster reef
pink shrimp	subadults	submerged aquatic vegetation; soft bottom; sand/shell; mangroves
white shrimp	postlarvae	water column associated
white shrimp	juveniles	emergent marsh; submerged aquatic vegetation; oyster reef; soft bottom; mangroves
white shrimp	subadults	soft bottom; sand/shell
white shrimp	adults	soft bottom
white shrimp	spawning adults	soft bottom
red drum	eggs	water column associated
red drum	larvae	submerged aquatic vegetation; soft bottom; water column
red drum	postlarvae	submerged aquatic vegetation; emergent marsh; soft bottom
red drum	early juveniles	submerged aquatic vegetation; soft bottom; hard bottom; sand/shell
red drum	late juveniles	submerged aquatic vegetation; emergent marsh; soft bottom; sand/shell
red drum	adults	submerged aquatic vegetation; emergent marsh; soft bottom; hard bottom; sand/shell
Spanish mackerel	early juveniles	estuarine; water column associated
Spanish mackerel	late juveniles	estuarine; water column associated
Spanish mackerel	adults	estuarine; Mainly oceanic; water column associated
red grouper	early juveniles	submerged aquatic vegetation; hard bottom
gray snapper	adults	hard bottom; soft bottom; reef; sand/shell; banks/shoals; emergent marsh
cobia	eggs	water column associated
cobia	larvae	water column associated
lane snapper	larvae	water column associated
lane snapper	postlarvae	water column associated; submerged aquatic vegetation

3.5.4.1 Brown Shrimp *(Penaeus aztecus)*

Brown shrimp are benthic omnivores distributed from Massachusetts to southern Florida, and throughout the Gulf Coast to the northwestern Yucatan Peninsula (NOAA 1997). The highest abundance of brown shrimp occurs along the Louisiana, Texas, and Mississippi coasts and the shelf waters in the northern Gulf Coast (Allen et al. 1980, NOAA 1985, Williams 1984). Brown shrimp are an estuarine-dependent species, spending some or all of their life cycle within an estuary. Brown shrimp spawn in depths greater than 60 feet during the fall and spring, and

postlarvae migrate to estuaries primarily from February to April (GMFMC 2004). Subadult brown shrimp migrate to offshore areas in the summer, supporting valuable commercial inshore and offshore fisheries (GMFMC 2016).

3.5.4.2 Pink Shrimp *(Penaeus duorarum)*

Pink shrimp occur in estuaries and nearshore to depths up to 110 m, with population densities highest in Gulf waters in or near seagrasses at depths ranging from 9-48 m (GMFMC 2016). Pink shrimp spawn year-round in the Tortugas, and postlarvae migrate into estuaries primarily during the spring and fall (GMFMC 2016). They prefer to inhabit sand/shell mud mixtures with less than one percent organic material, feeding on macrophytes, algae, diatoms, crustaceans, and fish (Eldred et al. 1961).

3.5.4.3 White Shrimp *(Penaeus setiferus)*

White shrimp can be found in coastal Gulf of America within estuaries and nearshore habitat up to depths of 40 m (GMFMC 2016). White shrimp spawn from spring through fall in depths between 9-34 m, and postlarvae migrations into estuaries occurs from spring through fall, with migration peaking in June and September (GMFMC 2016). Juvenile white shrimp inhabit mostly mud bottoms, feeding on sand, detritus, organic matter and various crustaceans (Darnell 1958, GMFMC 2016). Adult white shrimp inhabit soft mud or silt bottoms of the Gulf at depths less than 30 m (GMFMC 2004).

3.5.4.4 Red Drum *(Sciaenops ocellatus)*

Red drum are distributed throughout the Gulf of America. Depending on life stage, they are found from estuarine to offshore waters and occur over a variety of habitat types including submerged aquatic vegetation (SAV), soft bottom, hard bottom, emergent marsh, sand/shell; in early life stages they are associated with the water column (GMFMC 2004, 2016). Red drum spawn on the northern Gulf of America shelf during a relatively brief period, generally August into October (Wilson and Nieland 1994). The larvae and early juveniles are carried by tides and currents in late fall to the shallow estuaries, with peak ingress occurring in October. Larvae are carried through barrier island passes in the surface waters and juveniles move from the bay up the estuary to quiet backwater nursery areas to grow.

3.5.4.5 Spanish Mackerel *(Scomberomorus maculatus)*

Spanish mackerel occur in coastal zones of the western Atlantic and throughout the Gulf of America at depths up to 75 m (GMCMC 2016). Spanish mackerel is an epipelagic and neritic species often found in large schools which, in the past, have covered several square kilometers of area (NOAA 1997, Berrien and Finan 1977). Spawning occurs from May to September, with eggs occurring at depths less than 50 m (GMFMC 2016). Juveniles are found offshore and in beach surf and are not considered estuarine dependent (NOAA 1997). Adults are typically found offshore in neritic waters and along coastal areas, usually near barrier islands and passes (NOAA 1997). Spanish mackerel is an important commercial and recreational species along the Gulf Coasts, prized for its high food quality (NOAA 1997, Kilma 1959, Moe 1972, Powell 1975).

3.5.4.6 Red Grouper *(Epinephelus morio)*

Red grouper can be found nearshore and offshore at depths ranging from 0-100 m depending on the life stage. Early life stages are water column associated; juveniles settle on SAV and hard bottom habitats, and maturing adults transition onto reefs and hard bottom habitats offshore. Spawning occurs over hard bottoms and shelf edge/slope habitats and common prey items include fish, crustaceans, and cephalopods (GMFMC 2016).

3.5.4.7 Gray Snapper *(Lutjanus griseus)*

Gray snapper occur in estuaries and shelf waters of the Gulf of America and are particularly abundant off south and southwest Florida. Considered to be one of the more abundant snappers inshore, the gray snapper inhabits waters to depths of about 180 meters. Adults are demersal and mid-water dwellers, occurring in marine estuarine and riverine habitats. They occur up to 19.9 miles offshore and inshore as far as coastal plain freshwater creeks and rivers (GMFMC 2016).

3.5.4.8 Cobia *(Rachycentron canadum)*

Cobia are a predatory pelagic species found in coastal nearshore and offshore waters of the Gulf of America, at depths ranging from 1 meter to 70 meters. They are most commonly associated with shoals over hard banks, buoys, shipwrecks, oil rigs and other hard surfaces (GMFMC 2016). Adults feed on fishes and crustaceans, including crabs and shrimp. Cobia migrate seasonally from March through October between spawning and rearing habitats, determined primarily by suitable temperature conditions.

3.5.4.9 Lane Snapper *(Lutjanus synagris)*

Lane snapper can be found throughout the Gulf of America and in the western Atlantic from North Carolina to southeastern Brazil. Juveniles and adults are found across most habitat types, including SAV, sand/shell, reefs, soft bottom, banks, shoals, and mangroves. Adults occupy nearshore and offshore waters, at depths from 4 meters to 132 meters and temperatures of 61 °F to 84 °F (GMFMC 2016).

3.5.5 Wildlife

Existing Conditions

Louisiana's coastal wetlands support numerous Neotropical and other migratory avian species, such as rails, gallinules, shorebirds, wading birds, and numerous songbirds. The rigors of long-distance flight require most Neotropical migratory birds to rest and refuel several times before they reach their final destination. Louisiana coastal wetlands provide Neotropical migratory birds with essential stopover habitat on their annual migration routes. Passerine birds common to the project areas include sparrows, vireos, warblers, northern mockingbirds (*Mimis polygottos*), common grackles (*Quiscalus quiscula*), red-winged blackbirds (*Agelaius phoeniceus*), marsh wrens (*Cistothorus palustris*), blue jays (*Cyanocitta cristata*), northern cardinals (*Cardinalis cardinalis*), and American crows (*Corvus brachyrhynchos*). Coastal wetlands provide important fish and wildlife habitats, especially transitional habitat between estuarine and marine environments, used for shelter, nesting, feeding, roosting, cover, nursery, and other life requirements.

Emergent and submerged aquatic vegetation (SAV) and fresh, intermediate, brackish marsh and saline marsh wetlands are typically used by many different wildlife species, including: nutria (*Myocaster coypus*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), river otter (*Lutra canadensis*), white-tailed deer (*Odocoileus virginianus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), swamp rabbit (*Sylvilagus aquaticus*), eastern cottontail (*Sylvilagus floridanus*), nine-banded armadillo (*Dasypus novemcinctus*), coyote (*Canis latrans*), and a variety of smaller mammals. The Basin also provides habitat for the American alligator (*Alligator mississippiensis*), various species of salamanders, frogs, toads, turtles, as well as several species of venomous and non-venomous snakes.

Open water habitats provide wintering and multiple use functions for American white pelican (*Pelecanus erythrorhynchos*) and brown pelicans (*P. occidentalis*), seabirds, and other open water residents and migrants. Open water habitats provide wintering and multiple use functions for brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules, as well as other open water residents and migrants (LCWCRTF & WCRA, 1999). Various raptors such as great horned owl (*Bubo virginianus*), barred owl (*Strix varia*), red-shouldered hawk (*Buteo lineatus*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and bald eagle (*Haliaeetus leucocephalus*) may be present.

3.5.5.1 Species of Concern

Although it is delisted, the bald eagle (*Haliaeetus leucocephalus*) is still protected by the Bald and Golden Eagle Protection Act (BGEA) and the Migratory Bird Treaty Act (MBTA). Bald eagles nest in Louisiana from December through mid-May in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water (USFWS 2011). Nest sites typically include at least one perch with a clear view of the water or area where the eagles usually forage. Habitats suitable for use by the bald eagle are present throughout coastal Louisiana and can be found near the project area.

On November 17, 2009, the brown pelican (*Pelecanus occidentalis*) was removed from the federal list of threatened and endangered species. However, the brown pelican is still protected under the MBTA and is a state listed species. Brown pelicans are known to nest on barrier islands and the other coastal islands in St. Bernard, Plaquemines, Jefferson, Lafourche, and Terrebonne Parishes, and on Rabbit Island in lower Calcasieu Lake, in Cameron Parish. Habitat suitable for use by the brown pelican is present throughout coastal Louisiana, including the project area.

3.5.5.2 Colonial Nesting Birds and Seabirds

Coastal Louisiana contains habitat suitable for the support of colonial nesting waterbirds and seabirds which are protected by the MBTA. Colonial nesting birds (e.g., herons, egrets, night-herons, ibises, roseate spoonbills, anhingas, and cormorants) typically nest on islands or areas of higher ground that support small trees and shrubs. Some of the representative nesting seabird species in coastal Louisiana include: laughing gull (*Leucophaeus atricilla*), sooty tern (*Onychoprion fuscatus*), least tern (*Sternula antillarum*), gull-billed tern (*Gelochelidon nilotica*), caspian tern (*Hydroprogne caspia*), Forster's tern (*Sterna forsteri*), royal tern (*Thalasseus maximus*), sandwich tern (*Thalasseus sandvicensis*), black skimmer (*Rynchops niger*), herring gull (*Larus argentatus*), kelp gull (*Larus dominicanus*), and common tern (*Sterna hirundo*). Portions of the project area may contain habitats commonly inhabited by colonial nesting birds and seabirds.

3.5.5 Threatened And Endangered Species

Existing Conditions

Eight animal species under the jurisdiction of the USFWS and/or NMFS and presently classified as endangered or threatened are known to occur within the vicinity of the project area (Table 4). Currently, American alligators and shovelnose sturgeon (*Scaphirhynchus platorynchus*) are listed as threatened under the Similarity of Appearance clause in the ESA of 1973, as amended, but are not subject to ESA Section 7 consultation. No critical habitat for any threatened or endangered species has been designated within the project area, and none of these species are known to breed within the project vicinity.

Table 4. Threatened or Endangered Species that may occur in project area.

Common Name	Scientific Name	Status	Jurisdiction	
			USFWS	NFMS
West Indian Manatee	*Trichechus manatus*	T	X	
Eastern Black Rail	*Laterallus jamaicensis ssp. jamaicensis*	E	X	
Pallid Sturgeon	*Scaphirhynchus albus*	E	X	
Gulf Sturgeon	*Acipenser oxyrhynchus desotoi*	T	X	X
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	E	X	X
Loggerhead Sea Turtle	*Caretta caretta*	T	X	X
Green Sea Turtle	*Chelonia mydas*	T	X	X
Giant Manta Ray	*Manta birostris*	T		X

3.5.5.3 West Indian Manatee *(Trichechus manatus)*

West Indian manatees, also known as sea cows, are large aquatic mammals found in shallow, slow-moving rivers, estuaries, saltwater bays, canals, and coastal areas. Manatees forage on submerged, floating, and shoreline vegetation including seagrasses, algae, and invasive water hyacinth. There is a low chance that manatees would be found in the project area and surrounding shallow open waters; however, if manatees are observed within 100 yards of the "active work zone" during construction and dredging activities, the appropriate special operating conditions would be implemented as provided by the USFWS.

3.5.5.4 Eastern Black Rail *(Laterallus jamaicensis ssp. jamaicensis)*

Eastern black rails are sensitive, sparrow-sized marsh birds found in a variety of wetland habitats along the Gulf Coast. Eastern black rails require dense vegetative cover, foraging on seeds, insects, and other invertebrates as they walk along the shallows. Pairing and nesting occur in spring and summer. The primary stressors to the eastern black rail include suitable habitat loss, degradation, and fragmentation.

3.5.5.5 Pallid Sturgeon *(Scaphirhynchus albus)*

The pallid sturgeon is an endangered fish found in Louisiana, in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Pallid sturgeon occur in the Mississippi River downstream of its confluence with the Missouri River and Ohio River, and inhabit large, deep turbid river channels, usually in strong current over firm sand or gravel.

3.5.5.6 Gulf sturgeon *(Acipenser oxyrhynchus desotoi)*

The Gulf sturgeon was listed as threatened throughout its range on September 30, 1991. The Gulf sturgeon is an anadromous fish that migrates from salt water into coastal rivers to spawn and spend the warm summer months. Subadults and adults typically spend the three to four coolest months of the year foraging in estuaries of the Gulf of America before migrating inland into rivers. This migration typically occurs from mid-February through April. Most adults arrive in the rivers when temperatures reach 70 degrees Fahrenheit and spend eight to nine months each year in the rivers before returning to estuaries or the Gulf of America by the beginning of October.

3.5.5.7 Giant Manta Ray *(Manta birostris)*

In 2018, NOAA Fisheries listed the giant manta ray as threatened under the ESA. The species is found worldwide in tropical, subtropical, and temperate bodies of water and has been observed in estuarine waters, oceanic inlets, and within bays and intercoastal waterways. Based on a comprehensive review of scientific data available, to date, there are no areas within the jurisdiction of the United States that meet the definition of critical habitat for the giant manta ray.

3.5.5.8 Sea Turtles

The most seriously endangered of the sea turtles, Kemp's Ridley turtles (*Lepidochelys kempii*) occur mainly in bays and coastal waters of the Atlantic Ocean and Gulf of America (NMFS/USFWS 1992a). Nesting occurs on the northeastern coast of Mexico and occasionally on Texas Gulf Coast beaches from April to July. Along the Louisiana coast, turtles are generally found in shallow nearshore and inshore areas, and especially in salt marsh habitats, from May through October. No Kemp's Ridley sea turtle nesting habitat occurs near the project area, and nesting has not been known to occur in the area.

Loggerhead sea turtles (*Caretta caretta*) nest within the coastal United States from Louisiana to Virginia, with major nesting concentrations occurring on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (NMFS/USFWS 2009). Nesting and hatching for loggerheads in the Gulf of America occur from May through November.

Green sea turtles (*Chelonia mydas*) are more tropical in their distribution and are rarely seen in Louisiana coastal waters (LDWF 2011). Nesting in the southeastern U.S. occurs roughly from June through September (NMFS/USFWS 1991). Nesting within the project area is highly unlikely, as green sea turtles prefer to nest on high-energy beaches with deep sand and little organic content. Furthermore, the Minerals Management Service (1997) indicated that reports of green sea turtles nesting in the northern Gulf are "isolated and infrequent."

3.5.6 Cultural Resources

Existing Conditions

The National Historic Preservation Act of 1966 (NHPA) (P.L. 89 80 655), NEPA, and other applicable laws and regulations require Federal agencies to consider the effects of their undertaking on the environment and any significant cultural resources within the project area of the proposed undertaking, as well as its area of potential effect (APE). Typically, these studies

require archival searches and field surveys to identify any cultural resources. When significant sites are recorded, efforts are made to minimize adverse effects and preserve the site(s) in place. If any significant sites cannot be avoided and would be adversely impacted, an appropriate mitigation plan would be implemented to recover data that would be otherwise lost due to the undertaking.

The project area is located among small natural distributaries of the Mississippi River and among marsh lands between the river and Bays or the Gulf of America itself. The long natural history of the delta region has given much opportunity for land to be created and destroyed by the movement of water. Prior to modern historic development and settlement in Plaquemines Parish and the subsequent attempts at flood control and navigation improvement, this area was undoubtedly used by Native American populations, and prehistoric sites have been recorded in the general area but not within the currently proposed project area. In Historic times, the channels and Head of Passes passed through Spanish, French, Spanish again, and then American exploration and rule. Various existing passes were predominant over that time, with various small attempts at fortifications and dredging and deepening of channels for use. All the while, increasing settlement and trade within Plaquemines Parish was increasing ship traffic down the river, and events such as the Civil War led to increased shipwrecks and attempts to fortify or block the river. In the more recent era, several cultural resources surveys have been conducted both for terrestrial resources and for underwater resources such as shipwrecks. There have been no Phase I cultural resources surveys within the proposed footprint of the flow control feature or closure structure, and no cultural resources have been recorded.

The attempt to manage possible or perceived negative and positive effects to the environment as result of the Neptune Pass crevasse, has led to design changes of the engineering efforts for this management. Coordination letters to SHPO and Tribes have previously been written that document the evidence for a finding of no historic properties affected despite that no Phase I cultural resources survey overlays the APE. Prior designs managed the incoming waters and sediments at Neptune Pass, and waters and sediment midway through the Neptune Pass, but did not capture sediments that build land at the outlet of Neptune Pass. These designs have been added to the current efforts and to this EA, as depicted in Figures 1 and 3 of this EA.

3.5.7 Tribal Resources

Existing Conditions

Nine federally recognized tribes have an aboriginal/historic interest in this portion of Plaquemines Parish, Louisiana. The tribes are: 1) the Alabama Coushatta Tribe of Texas, 2) the Chitimacha Tribe of Louisiana, 3) the Choctaw Nation of Oklahoma, 4) the Coushatta Tribe of Louisiana, 5) the Jena Band of Choctaw Indians, 6) the Mississippi Band of Choctaw Indians, 7) the Muscogee Nation, 8) the Seminole Nation of Oklahoma, and 9) the Tunica-Biloxi Tribe of Louisiana.

There are no tribal lands, nor are there specific tribal treaty rights related to access or traditional use of the natural resources in Plaquemines Parish. There are many protected tribal resources within the parish. However, there is no evidence of them being in the project area.

3.5.8 Air Quality

Existing Conditions

National ambient air quality standards (NAAQS) have been set by the Environmental Protection Agency (EPA) for six common pollutants (also referred to as criteria pollutants) including: ozone, particulate matter, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, and lead. States are required by the Code of Federal Regulations to report to the EPA annual emissions estimates for point sources (major industrial facilities) emitting greater than, or equal to, 100 tons per year of volatile organic compounds, nitrogen dioxide, sulfur dioxide, particulate matter less than 10 microns in size; 1,000 tons per year of CO; or 5 tons per year of lead. Since ozone is not an emission, but the result of a photochemical reaction, states are required to report emissions of volatile organic compounds, which are compounds that lead to the formation of ozone. Plaquemines Parish is currently classified as in attainment of all NAAQS. This classification is the result of area-wide air quality modeling studies. Therefore, further analysis required by the general conformity rule of Section 176(c) of the Clean Air Act would not apply for the proposed action.

3.5.9 Water and Sediment Quality

Existing Conditions

As part of its surface water quality monitoring program, the Louisiana Department of Environmental Quality (LDEQ) routinely monitors 25 parameters on a monthly or bimonthly basis using a fixed station, long-term network (Monitored Assessments) (LDEQ 1996). Based upon those data and the use of less-continuous information (Evaluated Assessments), such as fish tissue contaminants data, complaint investigations, and spill reports, the LDEQ has assessed water quality fitness for the following uses: primary contact recreation (swimming), secondary contact recreation (boating, fishing), fish and wildlife propagation, drinking water supply, and shellfish propagation (LDEQ 1996). Based upon existing data and more subjective information, water quality is determined to either fully, partially, or not support those uses. A designation of "threatened" is used for waters that fully support their designated uses but that may not fully support certain uses in the future because of anticipated sources or adverse trends in pollution.

According to the LDEQ "2024 Louisiana Water Quality Inventory: Integrated Report," the Mississippi River – from Monte Sano Bayou to Head of Passes (segment no. LA070301_00), "fully supports" designated uses for primary contact recreation, secondary contact recreation, fish and wildlife propagation, and drinking water supply based on Evaluated Assessment data (LDEQ 2024). No sources of impairment were identified within this segment.

4 ENVIRONMENTAL CONSQUENCES

This section describes the direct, indirect, and cumulative effects of the No Action Alternative and the proposed action. Table 5 provides a list of resources in the project area and the anticipated impact(s) from implementation of the proposed action.

Table 5. Relevant Resources and their impact status, both adverse and beneficial.

Relevant Resource	Impacted	Not Impacted
Navigation	X	
Aquatic Resources/Fisheries	X	

Relevant Resource	Impacted	Not Impacted
Wetlands	X	
Essential Fish Habitat	X	
Wildlife	X	
Threatened and Endangered Species		X
Cultural Resources		X
Tribal Resources		X
Air Quality	X	
Water/Sediment Quality	X	

4.1 Navigation

Future Conditions with No-Action

Without implementation of the proposed action, shoaling would continue to occur in the segments of the Mississippi River adjacent to and downstream from Neptune Pass. Without increased maintenance dredging, further accumulations of shoal material would result in potentially restricted access to upstream ports and other facilities, with adverse impacts to the shipping industry and to area port economy. As scouring continues within Neptune Pass, the associated shoaling effects are likely to increase without implementation of the proposed action. Additionally, deep draft vessels would continue to experience suction when transiting the Mississippi River adjacent to Neptune Pass, with a potential for an increase in suction effects as Neptune Pass widens and flow increases.

Future Conditions with the Proposed Action

Construction of flow control structures would have positive direct impacts to navigation. Regulating the diverted flow from the Mississippi River through Neptune Pass would reduce current shoaling and scouring impacts occurring within the vicinity of the project, resulting in stability of the dimensions of the navigation channel and reduction in the required amount of maintenance dredging. Construction of the inlet flow control feature would also be expected to minimize the suction effects experienced by vessels transiting the adjacent segment of the Mississippi River. The modeled flow after Phase 1 construction of the revised design inlet structure is expected to be approximately 125,000 cubic feet per second (cfs) at a Mississippi River flow of 1 million cfs. If warranted and Phases 2 and 3 are constructed, the target flow after the completion of Phase 2 and Phase 3 is expected to be approximately 80,000 cfs at a Mississippi River flow of 1 million cfs.

4.1 Aquatic Resources / Fisheries

Future Conditions with No-Action

Without implementation of the proposed action, the uncontrolled flow from the Mississippi River through Neptune Pass would continue to promote scouring within the pass. The scoured area creates limited habitat for most fisheries species due to the resulting deep-water channel and reduction in shallow water habitat within the vicinity of the project area. However, the deposition of sediment from Neptune Pass and subsequent vegetative establishment occurring in the bays and waterways adjacent to the project area could result in newly created shallow water bottoms and marsh, providing habitat for numerous aquatic species.

Future Conditions with the Proposed Action

With implementation of the proposed action, water bottom habitat loss and displacement of benthic organisms and fishes within the project area would occur at both the inlet structure at the entrance of Neptune Pass and outlet structures (SREDs) in Quarantine Bay. However, these effects are expected to be temporary. Connectivity of the Mississippi River, Neptune Pass, and the adjacent bays and waterways would be maintained by constructing a "notch" within the flow control feature. This notch would allow for some water and sediment flow and allow for passage of aquatic species through Neptune Pass. Displaced fisheries species are expected to return to the project area once project activities are complete. Additionally, the flow control feature is also expected to slow the incoming flow from the Mississippi River into Neptune Pass, allowing for some suspended sediments to settle in the area surrounding the project. Over time, as the deep-water depths within the scoured area are reduced, benthic organisms and other fisheries species would be expected to colonize the new shallow, mud-bottom habitat. Furthermore, the stone substrate used for constructing both the inlet and outlet structures can be considered suitable habitat for some fisheries and aquatic species (Pennington et al. 1983).

With construction of the Outlet Structures, minimal adverse direct and indirect impacts to aquatic resources are anticipated. There is potential for increases in localized turbidity, noise, and wave action generated by construction activities to displace fisheries in the area; however, this would be a temporary disturbance, with aquatic species and fisheries likely to return following the completion of excavation and disposal activities. Overall, aquatic and fisheries populations would not likely be adversely affected because these species would move to existing adjacent habitat areas during construction activities.

4.2 Wetlands

Future Conditions with No-Action

Without implementation of the proposed action, continued scouring and widening of Neptune Pass would result in additional wetland loss and conversion of wetlands into open water habitat within Neptune Pass. However, deposition of sediment from Neptune Pass may be resulting in marsh creation in the bays and waterways adjacent to the project area.

Future Conditions with the Proposed Action

Implementation of the proposed action would not result in any direct impacts to wetland resources. Construction of the inlet feature would tie into the existing bankline adjacent to Neptune Pass but would not overlap any existing vegetated wetlands. Additionally, machinery required for any deposition of stone material and/or grading adjacent to the inlet feature would be expected to have minimal temporary indirect impacts to any existing vegetated wetlands. Indirectly, with construction of the inlet feature, cross-sectional area of the pass at the structure site will be reduced by 88 percent, reducing the freshwater influence of the river and the sediment it transports. It is anticipated that the splay-nourishing suspended sediment will continue to be maintained through a combination of sediment that flows through the inlet structure while being captured with the outlet structure (SREDs). Any existing deltaic splays would likely experience no major changes (i.e., no growth and no loss).

Implementation of the outlet features (SREDs) would result in indirect impacts to wetland resources within Quarantine Bay and potentially other waterways in the vicinity of the project as the flow through Neptune Pass would be reduced following project completion. These impacts

are primarily associated with the indirect effects of the reduction in sediment deposition following project completion. The sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound would now be trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay.

4.3 Essential Fish Habitat

Future Conditions with No-Action

Without implementation of the proposed action, no direct impacts to EFH within the immediate project area would occur. However, indirect impacts to EFH would likely occur as existing emergent marsh within Neptune Pass continues to be converted to open water habitat due to scouring and erosion caused by the uncontrolled flow being diverted through the pass. However, essential fish habitat may be positively impacted by the deposition of sediment from Neptune Pass and subsequent vegetative establishment in bays and waterways adjacent to the project area. These newly created shallow water bottoms and marsh provide essential habitat for numerous fish species.

Future Conditions with the Proposed Action

With implementation of the proposed action, short-term EFH impacts would include temporary and localized increases in water column turbidity during the excavation and construction of the Outlet Structure. However, the project area is a naturally turbid environment and increased turbidity is not expected to significantly affect EFH needs within the project area. Additionally, the stone substrate used for constructing the inlet flow control feature can be considered suitable habitat for some fisheries and aquatic species (Pennington et al. 1983).

Implementation of the proposed action would result in both a permanent direct impact as well as indirect impacts to EFH within the bays and waterways in vicinity of the project as the flow through Neptune Pass and sediment deposition would be reduced following project completion. With implementation of the proposed action, initially some EFH for dependent species would be permanently directly impacted during the construction of the outlet features (SREDs) from excavation of in-situ dredged borrow material for SREDs development in the shallow open waters of Quarantine Bay. The shallow open water bottom and associated EFH habitat (e.g., mud/sand substrates, SAV) would also be permanently directly impacted by the placement of stone material along the perimeters of each SRED. Indirectly, the SREDs would ultimately be converted to generally more productive categories of EFH (e.g., estuarine emergent marsh, marsh edge, inner marsh, marsh/water interface) as they eventually become colonized by emergent vegetation. Accretion of any sediments flowing through Neptune Pass on each SRED could potentially provide advantageous conditions for colonization by SAV. Thus, the proposed action would provide mainly positive indirect impacts to EFH in the project area.

While additional studies may provide clarification regarding the potential land building capabilities of the diversion in conjunction with the outlet features (SREDs), the purpose and need for the

proposed project is the elimination of the navigational hazard present within the Mississippi River. There is no current authority in this project for USACE to thoroughly study the marsh creation potential of leaving the pass open. The existing conditions within the vicinity of Neptune Pass pose a threat to navigation and commercial trade, and the potential expansion of Neptune Pass would further endanger vessels transiting the area in the absence of the proposed action.

4.4 Wildlife

Future Conditions with No-Action

Without implementation of the proposed action, wildlife within the immediate project may be indirectly impacted. Scour and erosion of the existing marsh along the banks of Neptune Pass and the Mississippi River would continue to occur, resulting in a reduction of habitat diversity and availability for resident terrestrial wildlife, migratory foul, and other avian species. However, wildlife may be positively impacted by the deposition of sediment from Neptune and subsequent vegetative establishment in bays and waterways adjacent to the project area. These newly created shallow water bottoms and marsh provide habitat for numerous wildlife species.

Future Conditions with the Proposed Action

With implementation of the proposed action, minimal adverse direct and indirect impacts to wildlife are anticipated. There is potential for noise or wave action generated by construction activities to displace terrestrial wildlife in the area; however, this would be a temporary disturbance, with wildlife likely to return following the completion of disposal activities. Migratory waterfowl and other avian species, if present, would likely be only temporarily displaced from the project area. Overall populations would not likely be adversely affected because these species would move to existing adjacent habitat areas during construction activities.

Implementation of the proposed action would result in indirect impacts to wildlife within the bays and waterways in the vicinity of the project as the flow through Neptune Pass would be reduced following project completion. The sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound would now be trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay. As such, any wildlife habitat benefits derived from additional land building processes would similarly be mostly restricted to Quarantine Bay, as opposed to areas further out in the Breton Sound.

While additional studies may provide clarification regarding the potential land building capabilities of the diversion in conjunction with the outlet features (SREDs), the purpose and need for the proposed project is the elimination of the navigational hazard present within the Mississippi River. There is no current authority in this project for USACE to thoroughly study the marsh creation potential of leaving the pass open. The existing conditions within the vicinity of Neptune Pass pose a threat to navigation and commercial trade, and the potential expansion of Neptune Pass would further endanger vessels transiting the area in the absence of the proposed action.

4.5 Threatened and Endangered Species

Future Conditions with No-Action

Without implementation of the proposed action, no direct or indirect impacts to threatened or endangered species or their critical habitat would occur.

Future Conditions with the Proposed Action

The USFWS concurred with CEMVN's determination of "not likely to adversely affect" in a letter dated May 21, 2024. Although threatened or endangered species may occur within the general project vicinity, their presence within the project area is highly unlikely. Furthermore, the proposed project area does not contain critical habitat for Federally listed species, and the open water areas surrounding the project area would allow them to easily avoid the project activities. Specific effect determinations for threatened or endangered species are listed below:

- For the Eastern black rail and pallid sturgeon, USFWS concurred with CEMVN's determination that the proposed action may affect but is not likely to adversely affect this species.

- For the West Indian manatee, monarch butterfly, and tricolored bat, USFWS concurred with CEMVN's determination that the proposed action is not likely to adversely affect this species.

For the West Indian manatee, CEMVN will implement appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees will also be included in the contract specifications.

Additionally, the CEMVN has determined that the proposed project will have no effect on any threatened or endangered species (Gulf sturgeon, giant manta ray, Kemp's Ridley turtle, Loggerhead sea turtle, and Green sea turtle) or critical habitat under the purview of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), Protected Species Division. Under the January 13, 2017 NMFS Procedural Instruction 02-110-20, the NMFS reviewed its consultative responsibilities under Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, and associated regulations at 50 C.F.R. part 402 and determined it will not provide formal written responses to requests for concurrence with a federal action agency's determination that its actions will not affect any ESA-listed species or designated critical habitat ("no effect" determination) (http://www.nmfs.noaa.gov/op/pds/index.html). As such, endangered species consultation with NMFS is complete.

4.6 Cultural Resources

Future Conditions with No-Action

Without implementation of the proposed action, the flow of water may increase or the existing banklines of the river may shift. Although no cultural resources have been reported within the direct APE, such shifts may eventually affect more distant or unrecorded resources.

Future Conditions with the Proposed Action

With implementation of the proposed action, no direct or indirect impacts to cultural resources would occur. To comply with Section 106 of the National Historic Preservation Act (NHPA), a conclusion of no historic properties affected was sent to the Louisiana State Historic Preservation Office (SHPO) and interested federally-recognized tribes on June 13, 2022. Concurrence from the SHPO was received on June 28, 2022. On July 7, 2022, the Muscogee Nation responded their wish to defer to other tribes. On July 11, 2022, the Choctaw of Oklahoma, and on July 13, 2022, the Chitimacha Tribe, responded their concurrence with the conclusion of no historic properties affected. No other tribal responses were received.

The current proposed project includes the same APE as was coordinated by the June 13, 2022 letters, but now adds an APE at the outlet of Neptune Pass, where sediment captures are proposed and will require borrow from adjacent areas. This APE was considered to be within proximity and procedures used to conclude the initial finding of no historic properties affected, and the same conclusion (no historic properties affected) was adopted for the new APE with no further coordination.

4.7 Tribal Resources

Future Conditions with No-Actions

Without implementation of the proposed action, the flow of water may increase or the existing banklines of the river may shift. Although no tribal resources have been reported within the direct APE, such shifts may eventually affect more distant resources.

Future Conditions with the Proposed Action

While Plaquemines Parish has a long history of occupation by Native American communities, prior to its establishment and throughout its history, there are currently no protected tribal resources, tribal rights, or Indian lands that have the potential to be significantly affected by the proposed actions within the project area. Therefore, CEMVN has determined that no tribal resources, rights, or lands would be significantly affected by implementing this action. The results of the NHPA Section 106 process thus far have confirmed this determination.

4.8 Air Quality

Future Conditions with No-Action

Without implementation of the proposed action, no direct or indirect impacts to ambient air quality would occur.

Future Conditions with the Proposed Action

With implementation of the proposed action, direct and indirect impacts to ambient air quality within the project area—and possibly farther afield—are expected to be temporary and primarily due to the emissions of construction equipment. Due to the short duration of the proposed project, any increases or impacts to ambient air quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of federal or state ambient air quality standards. Once all construction activities associated with the proposed action cease, air quality within the vicinity is expected to return to pre-construction conditions.

4.9 Water and Sediment Quality

Future Conditions with No-Action

Without implementation of the proposed action, no direct or indirect impacts to water quality or sediment quality would occur.

Future Conditions with the Proposed Action

With implementation of the proposed action, there would be some disturbances to ambient water quality in the project area; however, direct, and indirect impacts would be short-lived and highly localized near the inlet structure at Neptune Pass and the outlet structures in Quarantine Bay. Water bottom disturbances associated with construction activities would be expected cause temporary increases in turbidity and suspended solid concentrations, and a reduction in light penetration in the immediate vicinity. However, since the project is a naturally turbid environment and resident biota are generally adapted to, and very tolerant of, high suspended sediment concentrations, the effects would be negligible. Water quality is expected to return to pre-construction conditions soon after the completion of the construction of the proposed project.

5 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) Regulations define cumulative impacts as "the effects on the environment that result from the incremental impact of the action when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions." Cumulative impacts "can result from actions with individually minor but collectively significant effects taking place over a period of time."

Construction of the Inlet Structure (stone sill) is anticipated to reduce flows through Neptune Pass, while maximizing sediment transport efficiency using a notched sill approach. This will not only increase the likelihood of continued marsh growth in the receiving bays, but also decrease potential shoaling in the river downstream. Furthermore, increased deposition in the receiving bays and behind constructed SREDs further decreases the future flow capacity of the pass and associated navigational hazards.

SREDs placement in Quarantine Bay (backbay) reduces the head difference between the Mississippi River and backbay stage through a backwater effect, which, while significantly reducing the conveyance of Neptune Pass, leads to a more gradual spatial gradient in head loss. Most of this head loss would occur in the open water of the backbay and would not lead to scour of the existing marsh platform. It is expected that placement of SREDs alone reduces the Lower Mississippi River discharge diverted through Neptune from 16% to 10%. Similar flow reduction through sill structure placement alone would require constructing the sill height to at least -3 feet, significantly constricting the cross-sectional area of the channel and hindering small vessel trafficability (USACE 2023).

The concentration of sediment in the diverted water does not instantaneously affect the ability of the structure to reduce flow but rather slowly reduces its capacity over time. Continued aggradation within the pass and backbay, induced by the chevrons, will progressively decrease the flow diversion capacity until eventual crevasse closure, essentially accelerating the natural evolution of a delta (Kleinhans et al, 2013). Optimizing the sediment to water ratio (SWR) of the

sill structure allows design flow thresholds to be met while increasing the amount of sediment that can be diverted and advancing the natural delta-building processes.

Conversely, a full closure would leave the pass deprived of sediment, allowing factors such as sea level rise, erosional wave energy, and subsidence to further increase the head differences, leading to more frequent and more consequential crevasse formations along the lower Mississippi River east bank. The holistic approach of leveraging conveyance and energy potential energy factors offers a robust long-term solution instead of short-term repair.

Recent studies concerning the Mid-Barataria, Mid-Breton, and West Bay sediment diversions (Brown et al. 2019, Meselhe et al. 2012, Yuill et al. 2016) have analyzed the hydrodynamic and morphodynamic impacts of their implementation, and their findings corroborate those in this study of Neptune Pass. The previous studies advocate for the use of a SWR to quantify and assess the morphological changes in both the river and receiving bay and confirm that sediment aggradation in the receiving bay creates a backwater effect which propagates upstream to the river, reducing the flux through the pass over time. Furthermore, recent data and analysis of the West Bay diversion support the use of strategically placed SREDs as a technique to induce land building and accelerate basin filling in future diversions and crevasses (Henkel 2022).

6 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE (HTRW)

The USACE is obligated under Engineer Regulation (ER) 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within the vicinity of proposed actions. ER 1165-2-132 identifies that HTRW policy is to avoid the use of project funds for HTRW removal and remediation activities. An ASTM E1527-21 Phase 1 Environmental Site Assessment, HTRW 24-03, dated April 9, 2024, has been prepared for the Neptune Pass Channel, Neptune Pass Inlet Structure and Quarantine Bay Outlet Structures project area. The project area is not within the boundaries of any site designated by the EPA or State of Louisiana for a response action (either a removal action or a remedial action), under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or part of a National Priority List site under CERCLA. Aerial photographs were also reviewed, and a database search was conducted to identify possible Recognized Environmental Conditions (REC). No RECs were located within the footprints of the proposed project sites, and no evidence of HTRW was found. There is a low probability of encountering HTRW during construction of the project.

7 COORDINATION

Preparation of this EA and Finding of No Significant Impact (FONSI) have been coordinated with appropriate congressional, federal, tribal, state, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, have received copies of the draft EA and draft FONSI:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Natural Resources Conservation Service, State Conservationist
Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities

Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer
Plaquemines Parish Government
Alabama-Coushatta Tribe of Texas
Chitimacha Tribe of Louisiana
Choctaw Nation of Oklahoma
Coushatta Tribe of Louisiana
Mississippi Band of Choctaw Indians
Muscogee Nation
Jena Band of Choctaw Indians
Seminole Nation of Oklahoma
Tunica-Biloxi Tribe of Louisiana

8 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

There are many federal and state laws pertaining to the enhancement, management and protection of the environment. Federal projects must comply with environmental laws, regulations, policies, rules and guidance. Compliance with laws will be accomplished upon the 30-day public and agency review of EA #589 and associated Finding of No Significant Impact (FONSI).

8.1 Clean Air Act of 1972

The Clean Air Act (CAA) sets goals and standards for the quality and purity of air. It requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The project area is in Plaquemines Parish, which is currently in attainment of NAAQS. A general conformity determination is not required.

8.2 Clean Water Act of 1972 – Section 404 and Section 401

A Clean Water Act Section 404(b)(1) Public Notice entitled “Neptune Pass Rock Closure (Plaquemines Parish)” was distributed for public and agency review on August 2, 2024. During the draft EA #589 and 404(b)(1) Public Notice 30-day public review period, USACE received letters of support as well as critical feedback from both the public and non-governmental organizations regarding the proposed action, specifically the design of the Neptune Pass Flow Reduction Structures (Inlet and Outlet structures). EA 589 Appendix B contains both public comments and USACE responses received during the 30-day public and agency review period. A CWA Section 404(b)(1) evaluation was completed on February 12, 2025.

CWA Section 401 requires a Water Quality Certification from the Louisiana Department of Environmental Quality (LDEQ) that a proposed project does not violate established effluent limitations and water quality standards. Surface water quality standards are established in the Louisiana Administrative Code (LAC) Title 33, Part IX (2020). The CEMVN received a state-issued 401 Water Quality Certificate for the project on March 21, 2024 (WQC 220830-02/ CER20240001).

8.3 Coastal Zone Management Act of 1972

The Coastal Zone Management Act requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manger which is, to the maximum extent practicable, consistent with approved state management programs." A Federal consistency determination (C20220079 Mod 03) in accordance with the Louisiana Coastal Zone Management Program (LCZMP) pursuant to the Coastal Zone Management Act (CZMA) of 1972 was submitted to the Louisiana Department of Natural Resources (LDNR) on May 3, 2024. By letter dated June 18, 2024, the LDNR, Office of Coastal Management determined that the subject project was consistent with the LCZMP in accordance with Section 307 (c) of the CZMA of 1972, as amended (C20220079 Mod 03).

8.4 Endangered Species Act of 1973

The Endangered Species Act ("ESA") is designed to protect and recover threatened and endangered ("T&E") species of fish, wildlife and plants. Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the USFWS concurred with CEMVN's determination of "not likely to adversely affect" in a letter dated May 21, 2024. Specific effect determinations for threatened or endangered species are listed below:

- For the Eastern black rail and pallid sturgeon, USFWS concurred with CEMVN's determination that the proposed action may affect but is not likely to adversely affect this species.

- For the West Indian manatee, monarch butterfly, and tricolored bat, USFWS concurred with CEMVN's determination that the proposed action is not likely to adversely affect this species.

For the West Indian manatee, CEMVN will implement appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees will also be included in the contract specifications.

Additionally, the CEMVN has determined that the proposed project will have no effect on any threatened or endangered species (Gulf sturgeon, giant manta ray, Kemp's Ridley turtle, Loggerhead sea turtle, and Green sea turtle) or critical habitat under the purview of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), Protected Species Division. Under the January 13, 2017 NMFS Procedural Instruction 02-110-20, the NMFS reviewed its consultative responsibilities under Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, and associated regulations at 50 C.F.R. part 402 and determined it will not provide formal written responses to requests for concurrence with a federal action agency's determination that its actions will not affect any ESA-listed species or designated critical habitat ("no effect" determination) (http://www.nmfs.noaa.gov/op/pds/index.html). As such, endangered species consultation with NMFS is complete.

8.5 Magnuson-Stevens Fisheries Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended, Public Law (P.L.) 104-208, addresses the authorized responsibilities for the protection of EFH by NMFS in association with regional fishery management councils. The CEMVN and NMFS have agreed to complete EFH coordination requirements for federal civil works projects through the review and comment on National Environmental Policy Act documents prepared for those projects. The NMFS, Habitat Conservation Division, reviewed draft EA #589 and responded by e-mail dated August 22, 2024 with no objections to the proposed action.

8.6 Fish and Wildlife Coordination Act of 1934

The Fish and Wildlife Coordination Act (FWCA) provides authority for the USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It requires Federal agencies that construct, license or permit water resource development project to first consult with USFWS, NMFS and state resource agencies regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. The USFWS reviewed the proposed project and provided project specific recommendations in a Final Coordination Act Report received on February 12, 2025. The USFWS recommendations for the proposed action are listed below:

1. The Service recommends that the project area is monitored annually post-construction to determine if existing delta splays impacted by the project are experiencing land loss. If monitoring indicates changes from the current conditions, then the need for mitigation will have to be assessed.

   Response 1 – Concur.

2. The Service recommends that the project area is monitored annually post-construction to determine if salinities increase beyond expected as well as to determine any changes in marsh types and/or accelerated marsh loss. If monitoring indicates changes from the current conditions, then the need for mitigation will have to be assessed.

   Response 2 – Concur.

3. West Indian manatees occasionally enter Louisiana coastal waters and streams during the warmer months (i.e., June through September). During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and state law. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with manatees, although passively taking pictures or video would be acceptable. For more detail on avoiding contact with manatees refer to the Endangered and Threatened Species section of this document or contact this office.

Response 3 – Concur. CEMVN will implement appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees will also be included in the contract specifications.

4. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of project features and timing of construction. During project construction, a qualified biologist should inspect the proposed construction site for the presence of documented and undocumented wading bird nesting colonies and bald eagles.

    a. All construction activity during the wading bird nesting season (February through October 31 for wading bird nesting colonies, exact dates may vary) should be restricted within 1,000 feet of a wading bird colony. If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the USACE should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies.
    b. During construction activities, if a bald eagle nest is within or adjacent to the proposed project footprint, the applicant should follow the bald and golden eagle guidelines found on-line here to determine whether disturbance will occur and/or an incidental take permit is needed.

    Response 4 – Concur. The bald eagle was removed from the list of Endangered and Threatened Species in August 2007 but continues to be protect under the BGEPA and the MBTA. During nesting season, construction must take place outside of the USFWS/LDWF buffer zones. Additionally, the project area is located in habitats which are commonly inhabited by colonial nesting waterbirds and/or seabirds. The following conservations measures will be implemented to minimize disturbance to colonial nesting birds:

    1. For colonies containing nesting brown pelicans, all activity occurring within 2,000 feet of a rookery should be restricted to the non-nesting period (i.e. September 15 through March 31). Nesting periods may vary considerably among Louisiana's brown pelican colonies, however, so it is possible that this activity window could be altered based upon the dynamics of the individual colony. Brown pelicans are known to nest on barrier islands and the other coastal islands in St. Bernard, Plaquemines, Jefferson, Lafourche, and Terrebonne Parishes, and on Rabbit Island in lower Calcasieu Lake, in Cameron Parish.

    2. For colonies containing nesting wading birds (i.e. herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a rookery should be restricted to the non-nesting period (i.e., September 1 through February 15, exact dates may vary within this window depending on species present).

    3. For colonies containing nesting gulls, terns, and/or black skimmers, all activity occurring within 650 feet of a rookery should be restricted to the non-nesting period

(i.e., September 16 through April 1, exact dates may vary within the window depending on species present).

In addition, on-site contract personnel including project-designated inspectors will be trained to identify colonial nesting birds and their nests and avoid affecting them during the breeding season (i.e., the time period outside the activity window). Should on-site contractors and inspectors observe potential nesting activity, coordination with the LDWF and USFWS will be needed.

5. The Service recommends that the USACE contact the Service and the NMFS for additional ESA section 7 consultation if: 1) the scope or location of the proposed Project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat, 3) the action is modified in a manner that causes effects to listed species or designated critical habitat, or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in this consultation should occur before changes are made or finalized.

   Response 5 – Concur.

8.7 National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The procedures in 36 CFR Part 800 define how federal agencies meet these statutory responsibilities. The Section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation on historic properties, including the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) and any Tribe that attaches religious or cultural significance to historic properties that may be affected by an undertaking. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the USACE has determined that there are no historic properties, as defined in 36 CFR 800.16 (I) within the Neptune Pass area of potential effect (APE). Accordingly, a conclusion of “no historic properties affected” was sent to the Louisiana State Historic Preservation Office (SHPO) and interested federally-recognized Tribes on June 13, 2022. Concurrence from the SHPO was received on June 28, 2022. On July 7, 2022, the Muscogee Nation responded with their wish to defer to other Tribes. On July 11, 2022, the Choctaw of Oklahoma, and on July 13, 2022, the Chitimacha Tribe responded their concurrence with the conclusion of “no historic properties affected”. No other tribal responses were received.

The current proposed project includes the same APE as was coordinated by the June 13, 2022 letters, but now adds an APE at the outlet of Neptune Pass, where sediment captures are proposed and will require borrow from adjacent areas. This APE was considered to be within proximity and procedures used to conclude the initial finding of no historic properties affected, and the same conclusion (no historic properties affected) was adopted for the new APE with no further coordination.

9 CONCLUSION

Under the Proposed Action, sediment that is currently being transported from the river, through Neptune Pass, and deposited further out in Breton Sound would be trapped near the outlet of Neptune Pass. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay. As such, any benefits to wetlands, aquatic species, essential fish habitat, and wildlife derived from additional land building processes would similarly be mostly restricted to Quarantine Bay, as opposed to areas further out in the Breton Sound. While unavoidable impacts to previously discussed relevant resources would occur due to project actions within Neptune Pass and Quarantine Bay, the proposed action would not constitute a major federal action significantly affecting the human environment. Construction of the proposed action would result in the elimination of the present navigational threat within the river.

In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The strong currents flowing through Neptune Pass are also resulting in reports of deep draft vessels experiencing suction, created by the large amount of water flowing through Neptune Pass, as these vessels transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river and the segment of the Mississippi River from Baton Rouge to the Gulf of America supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

10 PREPARED BY

EA #589 and the associated FONSI were prepared by Mr. Mark H. Lahare, Environmental Protection Specialist, with relevant sections prepared by: Mr. Joseph Musso – HTRW; Mr. David Day – Greenhouse Gas; and Dr. Paul Hughbanks – Cultural Resources. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Regional Planning and Environment Division South, CEMVN-PDC-C; 7400 Leake Avenue; New Orleans, Louisiana 70118.

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Appendix A

Agency Coordination and Compliance

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
NEW ORLEANS, LOUISIANA 70118-3651

August 2, 2024

Regional Planning and
Environment Division, South
Environmental Compliance Branch

INTERESTED PARTIES

A draft Environmental Assessment (EA) #589 and associated Finding of No Significant Impact (FONSI) titled "Neptune Pass Rock Closure, Plaquemines Parish, Louisiana" have been prepared by the U.S. Army Corps of Engineers, New Orleans District (CEMVN).

Draft EA #589 has been prepared to evaluate the potential impacts associated with constructing flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana. In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed further in this revised draft EA.

An electronic copy of draft EA #589 and FONSI are located on the CEMVN District web page at: https://www.mvn.usace.army.mil/Missions/Environmental/NEPA-Compliance-Documents/Civil-Works-Projects/2024-Civil-Works/. Please review the documents and provide comments within 30 days of the date of this letter. A hard copy of the draft EA is available upon request.

Comments should be mailed to the attention of Mr. Mark Lahare; U.S. Army Corps of Engineers; Regional Planning and Environment Division South; New Orleans Environmental Branch; CEMVN-PDC-C; 7400 Leake Avenue; New Orleans, Louisiana 70118. Comments may also be provided by email to mark.h.lahare@usace.army.mil. Mr. Lahare may be contacted at (504) 862-1344 if questions arise.

Sincerely,

SMITH.MARK.R.1219443621
Digitally signed by SMITH.MARK.R.1219443621
Date: 2024.07.30 08:56:21 -05'00'

Mark R. Smith
Chief, Environmental Compliance Branch

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
NEW ORLEANS, LOUISIANA 70118-3651

August 2, 2024

Regional Planning and
Environment Division, South
Environmental Compliance Branch

NOTICE OF AVAILABILITY

A draft Environmental Assessment (EA) #589 and associated Finding of No Significant Impact (FONSI) titled "Neptune Pass Rock Closure, Plaquemines Parish, Louisiana" have been prepared by the U.S. Army Corps of Engineers, New Orleans District (CEMVN).

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Sincerely,

SMITH.MARK.R.1219443621 Digitally signed by SMITH.MARK.R.1219443621 Date: 2024.07.30 08:54:59 -05'00'

Mark R. Smith
Chief, Environmental Compliance Branch

Regional Planning and
Environment Division South
Environmental Compliance Branch

CLEAN WATER ACT, SECTION 404
PUBLIC NOTICE

Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana
Neptune Pass Rock Closure
Plaquemines Parish, Louisiana

Interested parties are hereby notified that the U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN), proposes to construct flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana (Figure 1). In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay. Project construction involves discharge of dredged material and fill into navigable waters of the U.S.; therefore, the provisions of Title 33 CFR Parts 336.1(b)(1) and 337.1, effective April 26, 1988, are applicable and issuance of this public notice is required.

This notice is being distributed to all interested state and Federal agencies and other known parties to make known USACE, CEMVN's intentions to initiate and continue maintenance in the areas of work listed herein.

PROJECT: Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Neptune Pass Rock Closure.

PROJECT AUTHORITY: The project, "Mississippi River, Louisiana, Between Baton Rouge and New Orleans" was authorized by the River and Harbor Act of 1925, in accordance with the report of the Chief of Engineers published as House Document Number 105, 69th Congress. The project, "Mississippi River at and near New Orleans, Louisiana was authorized by the River and Harbor Act of 1937 in accordance with the report of the Chief of Engineers published as House Document 597, 75th Congress. The project, Mississippi River, Baton Rouge to the Gulf of Mexico, was authorized by Section 2 of the River and Harbor Act of 1945 (PL 79-14) in accordance with the report of the Chief of Engineers in House Document No 215 of the 76th Congress, and by the River and Harbor Act of 1962 in accordance with the report of the Chief of Engineers in

Senate Document No. 36 of the 87th Congress. The project, “Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana” was authorized by the Supplemental Appropriations Act of 1985 and by Section 201 of the Water Resources Development Act of 1986, both in accordance with the Report of the Chief of Engineers dated April 9, 1983.

Although the Water Resources Development Act of 1986 authorized the construction and maintenance of the project channel to a depth of 55 feet, current approved construction, as supported by a Project Partnership Agreement with the Louisiana Department of Transportation and Development, is currently being constructed and ultimately maintained (when constructed) to a depth of 50 feet. For the project reaches below the Port of New Orleans, the approved channel depth of 50 feet has been constructed and is being maintained, as necessary to sustain that depth. The proposed work at Neptune Pass must be performed in order to maintain the integrity and safety of the 50-foot navigation channel in this reach of the river.

PROJECT PURPOSE AND NEED: The purpose of the proposed action is to eliminate a navigational hazard in the Mississippi River. Neptune Pass is a natural crevasse which existed prior to 1985 but has increased significantly in size and flow during recent annual high river events, with a noticeable enlargement after 2019. This newly enlarged pass is diverting approximately eight times more water than the other five adjacent outlets combined in this 3-mile reach of the Mississippi River. In an effort to best reduce sedimentation within the Mississippi River attributed to the expansion of Neptune Pass, the location and dimensions of the proposed action were designed to approximately match the outlet before the riverside bank protection failed and the pass was allowed to develop. Approximately 16% of the Mississippi River is currently being diverted through Neptune Pass, and a reduction in diverted flow to 6%, the historical flow rate prior to expansion of Neptune Pass in 2019, is expected following construction of the proposed action; however, flow through the pass would vary according to river stage within the vicinity of the project.

Construction of flow control features within Neptune Pass (inlet structure) and Quarantine Bay (outlet structures – SREDs) would decrease riverbank scour and erosion within the Pass and control water flow being diverted from the Mississippi River. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths (Figure 2). In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The large amount of water flowing through Neptune Pass is also resulting in reports of pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to

deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river, and the segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020. There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

DESCRIPTION OF ACTION: **Neptune Pass Flow Reduction Structures**
(All elevations referenced for the proposed action structures are to North American Vertical Datum 1988 (NAVD88) (epoch 2004.65), unless otherwise noted).

The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of Mexico from continuing to grow. The proposed action comprises two features that would work together to provide a sustainable solution to remove the hazard. There would be stone placed to raise the existing riverbank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There would be Sediment Retention Enhancement Devices (SREDs) built with earthen material excavated from adjacent mud-bottoms, as well as placement of geotextile fabric and stone riprap. The SREDs would be constructed at the outlet of Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features would be placed in navigable water. The target flow after construction is approximately 80,000 cubic feet per (cfs) second at a Mississippi River flow of 1 million cfs.

Inlet Structure
The proposed Neptune Pass Inlet Structure is a stone sill that would reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure centerline would be curved to sit on top of the existing bank line sill at the confluence of the Mississippi River and Neptune Pass. The center of the structure would have a 100-foot-wide notch at an elevation of -26 feet and a 115-foot-wide crown. On both sides of the notch, it would slope up at a 1 vertical on 2 horizontal (1V:2H) slope to an elevation of -8 feet and a 50-foot-wide crown which would extend 170 feet on both sides of the center notch. Both sides would then slope up at a 1V:2H slope to an elevation of +5 feet and a 5-foot-wide crown to tie into the upstream and downstream Mississippi River bank. The existing foreshore dike extending approximately 675 feet upstream of the sill would be capped with stone to match the tie in elevation of +5 feet. The structure would slope down to the existing ground from the elevations previously

described at a 1V:1.75H slope perpendicular to the Mississippi River bank. The inlet of Neptune Pass would be reduced to an area of approximately 7,200 square feet. The structure would be constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds. A 3-foot-thick layer of stone paving scour protection requiring approximately 20,000 tons of 1,200-pound stone would be placed approximately 325 feet into the pass from the crown of the structure. Figure 3 shows the inlet structure features. Figure 4 shows a side scan rendition of the inlet structure.

Outlet Structures

The proposed Neptune Pass Outlet Structures would consist of multiple armored V-shaped SREDs placed between the -6 and -10-foot contour. Barge mounted excavators would be utilized to excavate earthen material from adjacent mud-bottoms and side cast material to create each SRED. It is expected that a total of approximately 520,000 cubic yards of earthen material would be required for construction of the SREDs. The SREDs would have a five-foot top width and would be constructed to a target elevation of +5.0 feet, with side slopes of 1V:2H. Each SRED would consist of multiple terraces that are 300 feet long with 100-foot gaps between each terrace. The SREDs would also require placement of approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile. All work would be via floating plant. Placement of stone would be via barge mounted excavator or dragline. Figure 5 shows the outlet structure features (SREDs). Figure 6 shows a rendition of the approximate proposed location of the outlet structures (SREDs).

METHODS OF DISCHARGE: All work will be via floating plant. Stone required for the proposed action will be discharged via barge mounted excavator or dragline positioned within Neptune Pass.

ADJACENT PROPERTIES: None.

DREDGING BY OTHERS: No accurate estimate can be given to the amounts and/or frequency of dredging required to maintain non-Federal facilities in the vicinity of this project.

NATIONAL ENVIRONMENTAL POLICY ACT DOCUMENTATION: The environmental impacts associated with maintaining channels, outlets, and specified dimensions of the Mississippi River from Baton Rouge, Louisiana to deep water in the Gulf of Mexico were addressed in the Final Environmental Impact Statement (EIS), “Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana”. A Statement of Findings (SOF) for this EIS was signed on February 15, 1974. The project commences at the Port of Baton Rouge, 128.6 miles above the Port of New Orleans, and continues through the Port of New Orleans to about 94.5 miles south to the Head of Passes. Below the Head of Passes, two channels, Southwest Pass and South Pass, connect to the Gulf of Mexico.

Supplement I to the 1974 EIS addressed unintentional omissions in the original EIS and unanticipated changes in dredging requirements. A SOF for Supplement I was signed on March 8, 1976.

Supplement II to the 1974 EIS addressed the addition of recommended features to the existing project to reduce the amount of maintenance dredging required to maintain navigation within the project area. A SOF was signed for Supplement II on May 15, 1985.

The "Integrated General Reevaluation Report & Supplement III to the Final Environmental Impact Statement, Mississippi River Ship Channel, Baton Rouge to the Gulf of Mexico, Louisiana" addressed navigation improvements for deep draft navigation access to ports located along the Mississippi River in southeast Louisiana. A Record of Decision (ROD) was signed for Supplement III on August 3, 2018.

EA #595, Neptune Pass Emergency Armoring, Plaquemines Parish, Louisiana, addressed potential impacts associated with emergency construction of a stone revetment structure along the eastern bank of the mouth of Neptune Pass, adjacent to Mississippi River mile 23.9, in Plaquemines Parish, Louisiana. The emergency action required placement of approximately 58,000 tons of stone by barge mounted equipment positioned both within the Pass and Mississippi River to stabilize the rapidly eroding eastern bank of the mouth of Neptune Pass. The stone was placed in open water and no wetlands within the area were impacted by the action. The project area is approximately 8 acres of open water located along the eastern bank of the mouth of Neptune Pass. Construction of the stone revetment structure was completed on June 3, 2023. A FONSI was signed for EA #595 on March 13, 2024.

The impacts of the proposed action and alternative to the proposed action (No-Action) will be analyzed and disclosed in draft EA #589, which is scheduled to be available for public review and comment late July 2024.

STATE WATER QUALITY CERTIFICATION: CWA Section 401 requires a Water Quality Certification from the Louisiana Department of Environmental Quality (LDEQ) that a proposed project does not violate established effluent limitations and water quality standards. Surface water quality standards are established in the Louisiana Administrative Code (LAC) Title 33, Part IX (2020). The CEMVN received a state-issued 401 Water Quality Certificate for the project on March 21, 2024 (WQC 220830-02/ CER20240001).

COASTAL ZONE CONSISTENCY DETERMINATION: A Federal consistency determination (C20220079 Mod 03) in accordance with the Louisiana Coastal Zone Management Program (LCZMP) pursuant to the CZMA of 1972 was submitted to the Louisiana Department of Natural Resources (LDNR) on May 3, 2024. By letter dated June 18, 2024, the LDNR, Office of Coastal Management determined that the subject

project was consistent with the LCZMP in accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, as amended (C20220079 Mod 03).

MAGNUSON-STEVENS FISHERIES CONSERVATION AND MANAGEMENT ACT: The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended, Public Law (P.L.) 104-208, addresses the authorized responsibilities for the protection of Essential Fish Habitat (EFH) by NMFS in association with regional fishery management councils. The NMFS has a "findings" with the CEMVN on the fulfillment of coordination requirements under provisions of the MSFCMA. In those findings, the CEMVN and NMFS have agreed to complete EFH coordination requirements for federal civil works projects through the review and comment on National Environmental Policy Act documents prepared for those projects. Draft EA #589 represents CEMVN's initiation of EFH consultation as required under the Magnuson-Stevens Fishery Conservation and Management Act.

THREATENED AND ENDANGERED SPECIES: Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the USACE has determined that the Proposed Action would not likely adversely affect the endangered pallid sturgeon, West Indian Manatee, eastern black rail, or any critical habitat. The U.S. Fish and Wildlife Service concurred with the USACE's determination in a letter dated May 21, 2024.

CULTURAL RESOURCES: Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The procedures in 36 CFR Part 800 define how federal agencies meet these statutory responsibilities. Pursuant to Section 106 of the NHPA of 1966, as amended, the USACE has determined that there are no historic properties, as defined in 36 CFR 800.16 (l) within the Neptune Pass area of potential effect (APE). Accordingly, a conclusion of "no historic properties affected" was sent to the Louisiana State Historic Preservation Officer and interested federally-recognized Tribes on June 13, 2022. Concurrence from the SHPO was received on June 28, 2022. On July 7, 2022, the Muscogee Nation responded with their wish to defer to other Tribes. On July 11, 2022, the Choctaw of Oklahoma, and on July 13, 2022, the Chitimacha Tribe responded their concurrence with the conclusion of "no historic properties affected". No other tribal responses were received.

The current proposed project includes the same APE as was coordinated by letter dated June 13, 2022, but now adds an APE at the outlet of Neptune Pass, where sediment captures are proposed and will require borrow from adjacent areas. Coordination of effects for the new portion of APE, are currently underway.

COORDINATION: The following is a partial list of agencies to which a copy of this notice is being sent:

U.S. Environmental Protection Agency, Region VI
U.S. Fish and Wildlife Service
National Marine Fisheries Service
U.S. Coast Guard, Eighth District
Louisiana Department of Environmental Quality
Louisiana Department of Natural Resources
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Transportation and Development
Louisiana State Historic Preservation Officer

This notice is being distributed to these and other appropriate Congressional, federal, state, and local interests, environmental organizations, and other interested parties.

PROJECT PLANS: Plans for the proposed work will be on file in the Regional Planning and Environment Division South Office, Environmental Compliance Branch, Coastal Compliance Section, U.S. Army Corps of Engineers, New Orleans District, 7400 Leake Avenue, New Orleans, Louisiana 70118, and may be seen by anyone having an interest in them.

PUBLIC INVOLVEMENT: Interested parties may submit comments regarding the proposed work in writing to Mr. Mark Lahare, U.S. Army Corps of Engineers, New Orleans District, 7400 Leake Avenue, New Orleans, Louisiana 70118. Mr. Lahare may also be reached by e-mail at mark.h.lahare@usace.army.mil and by telephone at (504) 862-1344.

Any person who has an interest that may be affected by proposed project action may request a public hearing. The request must be submitted in writing to Mr. Stevens within the comment period of this notice and must clearly set forth the interest that may be affected and the manner in which the interest may be affected by the proposed action. You are requested to communicate the information contained in this notice to any parties who may have an interest in the proposed action.

Sincerely,

Mark R. Smith
Chief, Environmental Compliance Branch

Enclosures

COMMENT PERIOD FOR THIS PUBLIC NOTICE EXPIRES: **September 2, 2024**

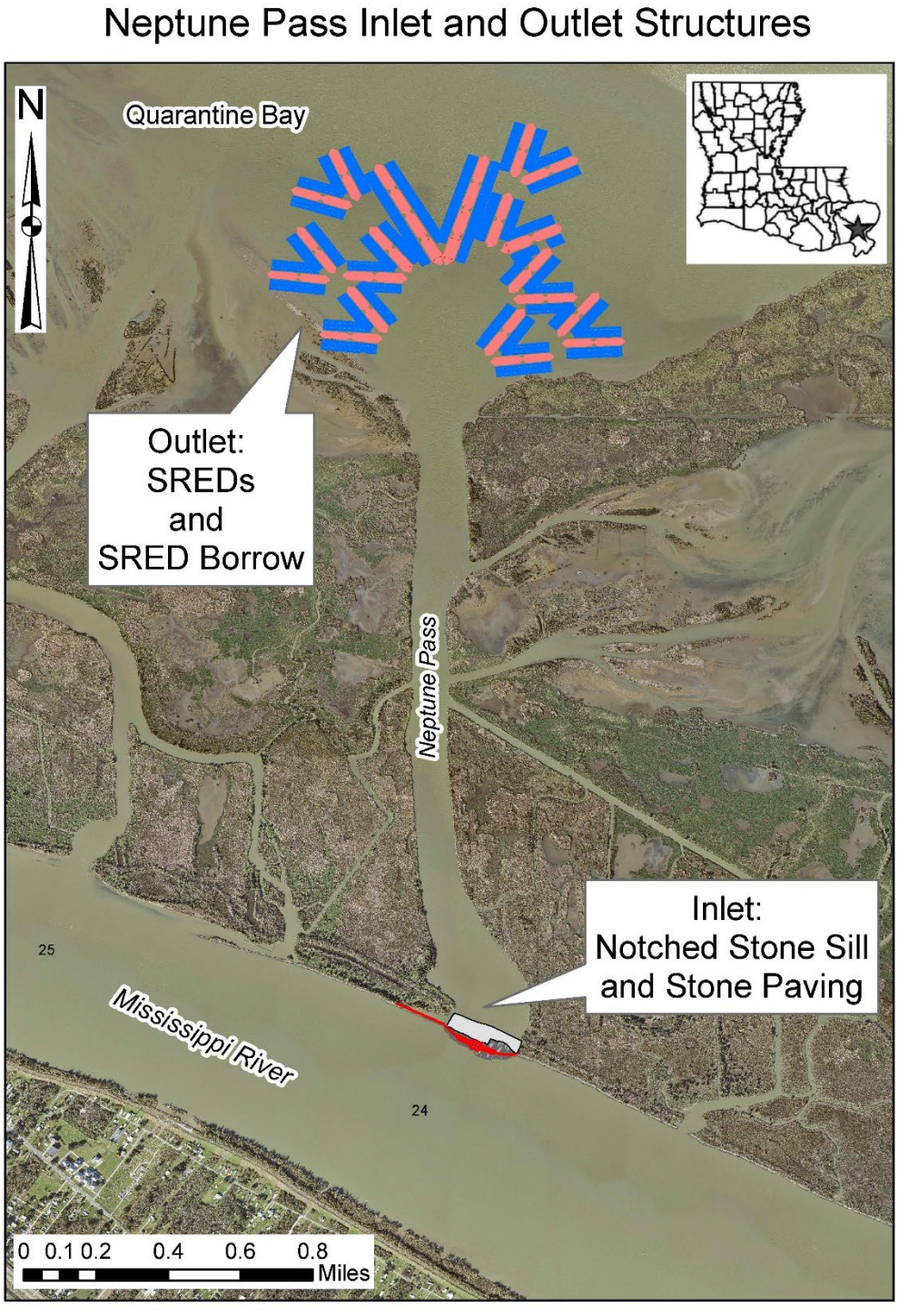

Figure 1. Project vicinity map and features

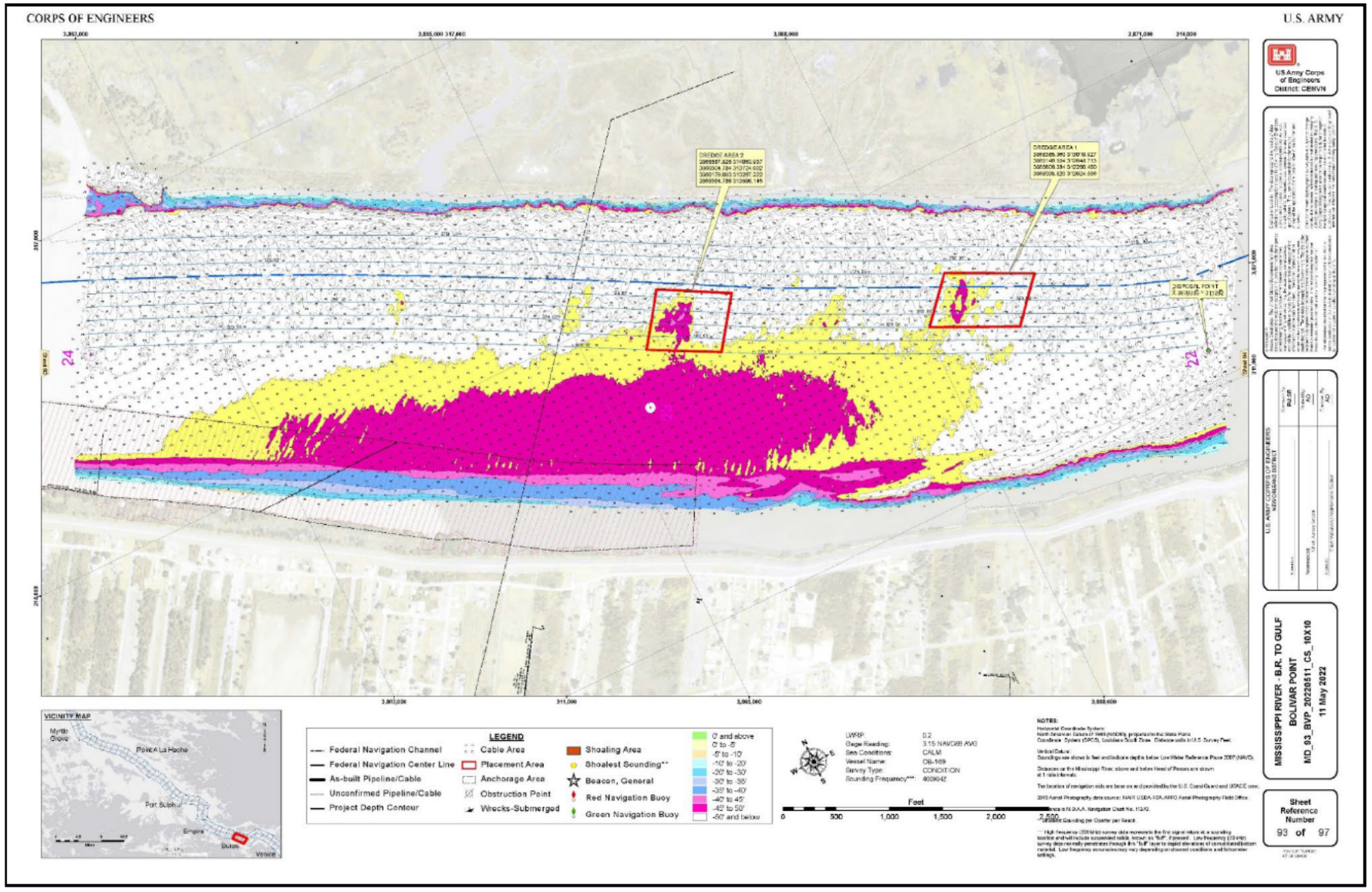

Figure 2. Shoaling occurring within the Mississippi River attributed to the expansion of Neptune Pass.

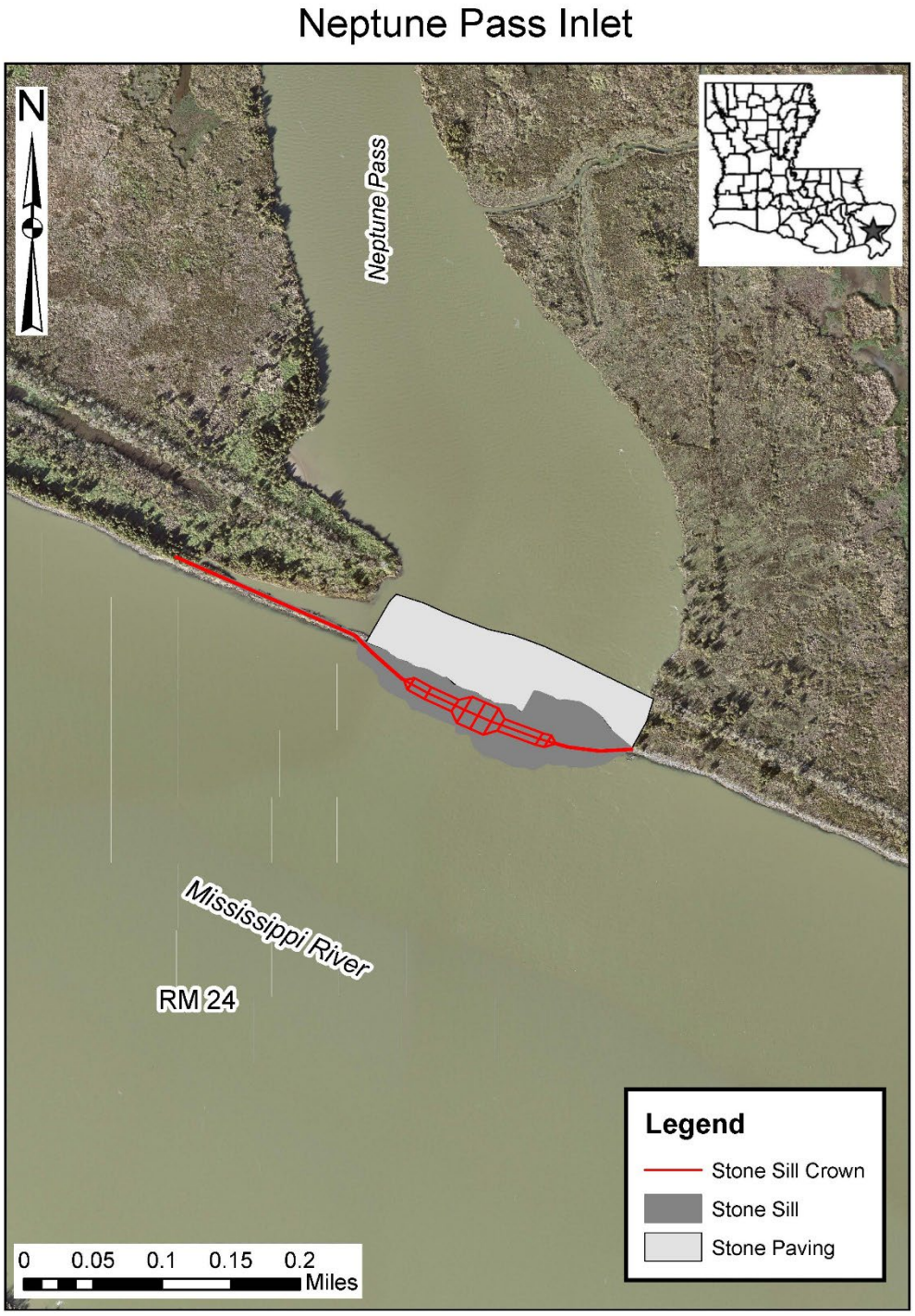

Figure 3. Inlet Structure features.

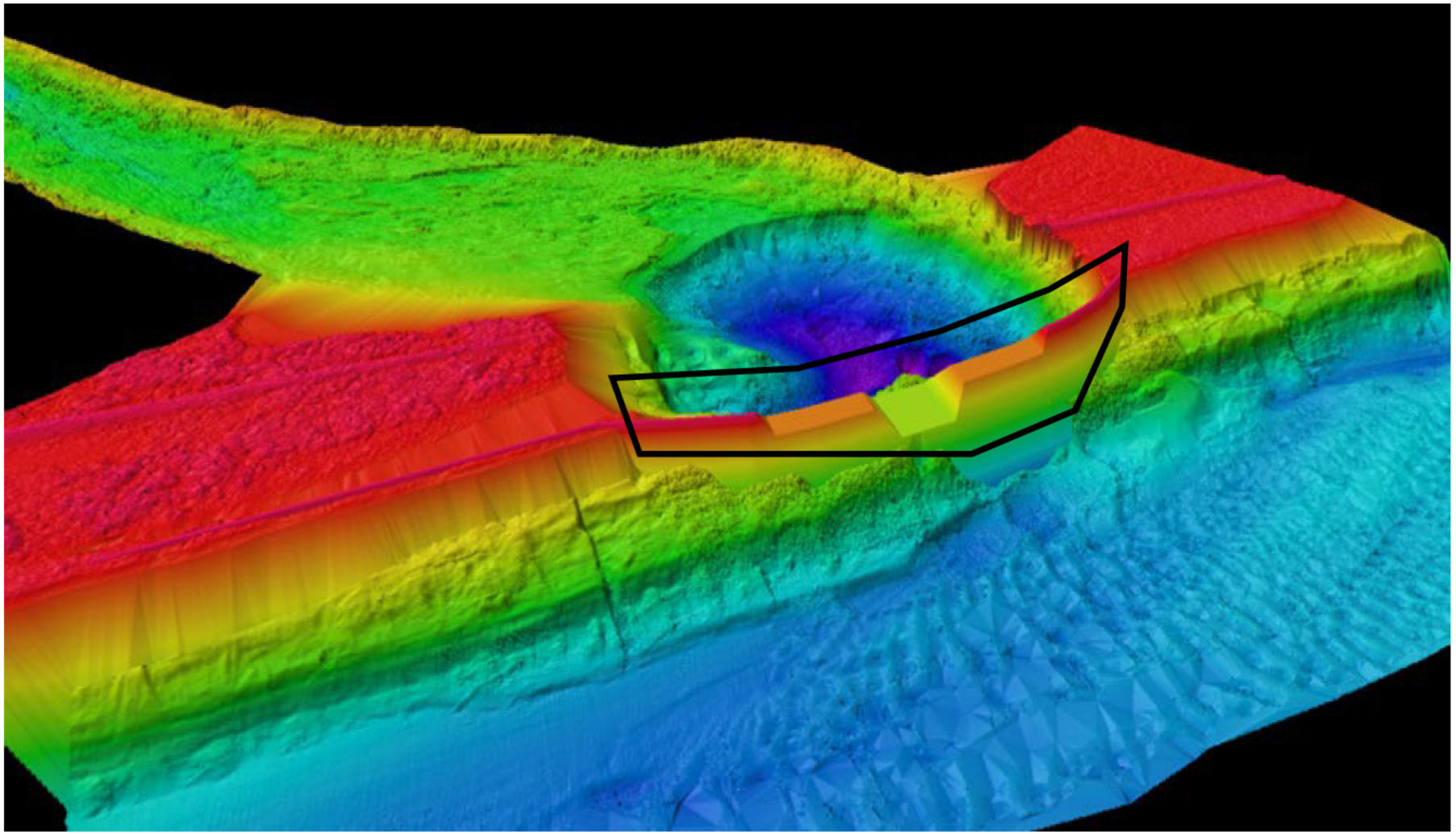

Figure 4. Side scan rendition of Inlet Stone Sill (limits delineated by black polygon outline).

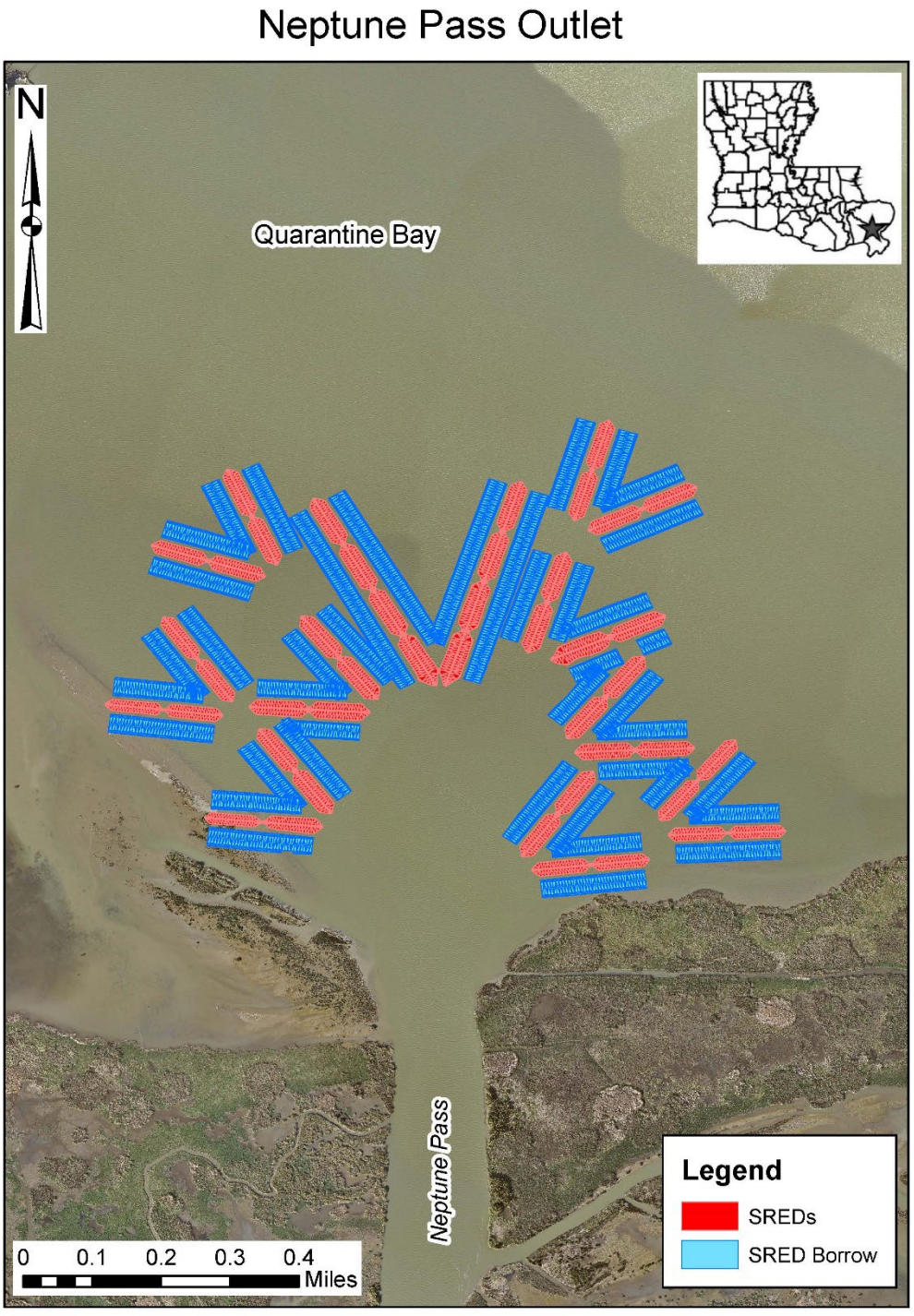

Figure 5. Outlet Structures features.

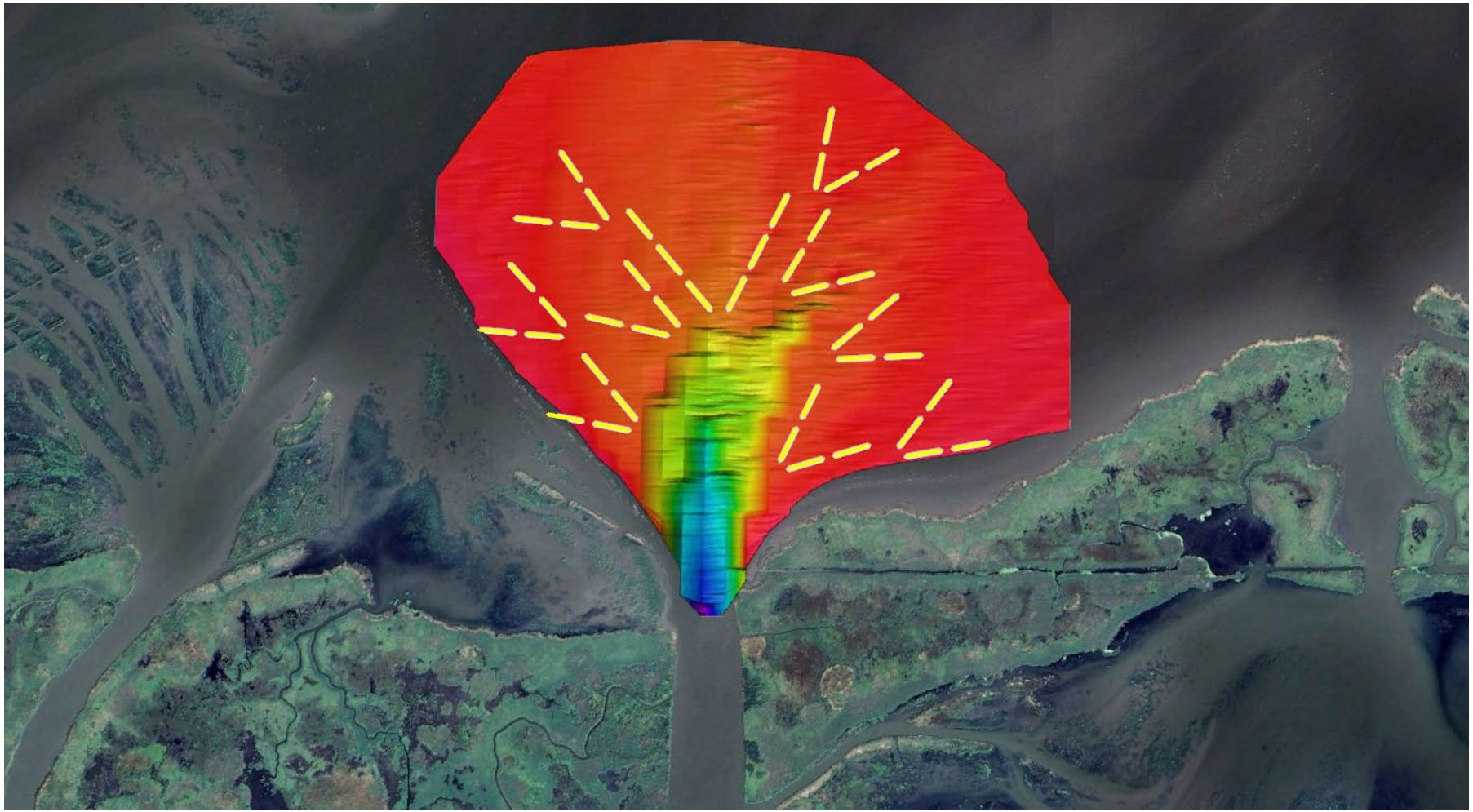

Figure 6. Rendition of approximate location(s) and V-shaped design of Outlet SREDS in Quarantine Bay.

SECTION 404(b)(1) EVALUATION

Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana
Neptune Pass Rock Closure
Plaquemines Parish, Louisiana

The following short form 404(b)(1) evaluation follows the format designed by the Office of the Chief of Engineers. As a measure to avoid unnecessary paperwork and to streamline regulation procedures while fulfilling the spirit and intent of environmental statutes, the U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), is using this format for all proposed project elements requiring 404 evaluations but involving no significant adverse impacts.

In August 2024, USACE released draft EA #589 and the 404(b)(1) Public Notice initiating the 30-day public and agency review period (August 2, 2024 to September 3, 2024). During the public review period, USACE received letters of support as well as critical feedback from both the public and non-governmental organizations regarding the proposed action, specifically the design of the Neptune Pass Flow Reduction Structures (Inlet and Outlet structures)[1]. In response to requests for additional modeling information associated with the Inlet and Outlet structures, USACE released the draft November 2023 Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure[2], prepared by the USACE, Engineering Division, Hydrology, Hydraulics, and Coastal Engineering Branch and Lower Mississippi River and Tributaries Engineering Branch. The 2023 modeling report stated that it was based on the project design as of November 2023 and that the report may be revised/updated in the event of future proposed design changes. At that time, the proposed project was still in the Engineering and Design Phase for both the Inlet Structure and Outlet structures. More specifically, USACE was in the Geotechnical Design Phase and actively incorporating geotechnical information into the design of the project features. In December 2024, USACE completed the Geotechnical Design Phase and has since revised the proposed action. The proposed action design changes from the August 2024 draft EA and 404(b)(1) Public Notice are further described in *PROJECT DESCRIPTION - REVISED*.

PROJECT TITLE: Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Neptune Pass Rock Closure, Plaquemines Parish, Louisiana.

PROJECT AUTHORITY: The project, “Mississippi River, Louisiana, Between Baton Rouge and New Orleans” was authorized by the River and Harbor Act of 1925, in accordance with the report of the Chief of Engineers published as House Document Number 105, 69th Congress. The project, “Mississippi River at and near New Orleans, Louisiana was authorized by the River and Harbor Act of 1937 in accordance with the report of the Chief of Engineers published as House Document 597, 75th Congress. The project, Mississippi River, Baton Rouge to the Gulf of Mexico, was authorized by Section 2 of the River and Harbor Act of 1945 (PL 79-14) in accordance with the report of the Chief of Engineers in House Document No 215 of the 76th Congress, and by the River and Harbor Act of 1962 in accordance with the report of the Chief of Engineers in Senate Document No. 36 of the 87th Congress. The project, “Mississippi River

[1] Refer to EA 589 Appendix B – Public Comments and Responses.
[2] Refer to EA 589 Appendix C – Draft November 2023 Neptune Pass Model Report.

Ship Channel, Gulf to Baton Rouge, Louisiana" was authorized by the Supplemental Appropriations Act of 1985 and by Section 201 of the Water Resources Development Act of 1986, both in accordance with the Report of the Chief of Engineers dated April 9, 1983.

PROJECT DESCRIPTION - REVISED: **Neptune Pass Flow Reduction Structures**
(All elevations referenced for the proposed action structures are to North American Vertical Datum 1988 (NAVD88) (epoch 2004.65), unless otherwise noted).

The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of Mexico from continuing to grow. The proposed action comprises two features that would work together to provide a sustainable solution to remove the hazard. There would be stone placed to raise the existing riverbank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There would be Sediment Retention Enhancement Devices (SREDs) built with earthen material excavated from adjacent mud-bottoms, as well as placement of geotextile fabric and stone riprap. The SREDs would be constructed at the outlet of Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features would be placed in navigable water.

Based upon geotechnical analysis completed in December 2024, USACE determined that a phased construction approach of the inlet and outlet structures was warranted to further assess the real time effects on Navigation during periods of high river flow and to be able to plan efficient and cost effective follow up actions, as needed. The proposed phased construction and real time monitoring approach would include the following:

- Phase 1 - construction of a modified, less restrictive stone inlet structure at the at the entrance of Neptune Pass that is similar to the proposed structure as described in draft EA #589.
- If warranted, Phase 2 - raise the Phase 1 stone structure to further reduce the cross-sectional area of the entrance of Neptune Pass.
- If warranted, Phase 3 - construct the outlet structures (i.e., Sediment Retention Enhancement Devices (SREDs)) in a modified configuration. The SREDs would be designed to increase the elevations in Quarantine Bay at the outlet of Neptune Pass to back up the flow and decrease the flow capacity. The SREDs would consist of dredged material, stone, geotextile, wooden piles, or a combination of these options.
- Upon completion of each phase of construction, multibeam surveys and flow measurements will be conducted routinely to assess the effects to bathymetry and flow in Neptune Pass and the Mississippi River. Post construction of the inlet structure, USACE will engage with the navigation industry to determine any positive or negative real time effects on navigation.

The modeled flow after Phase 1 construction of the revised design inlet structure is expected to be approximately 125,000 cubic feet per second (cfs) at a Mississippi River flow of 1 million cfs. If Phase 2 and Phase 3 are constructed, once those features are complete, the target flow is

expected to be approximately 80,000 cfs at a Mississippi River flow of 1 million cfs. Refer to final EA #589: Figure 1 shows the project area with inlet and outlet structures.[3]

Inlet Structure – Revised Design[4]

The proposed Neptune Pass Inlet Structure is a stone sill that would reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure would begin with a tie in at the end of the Mississippi River foreshore dike on the upstream side of the Neptune Pass inlet and would end with a tie in at the end of the Mississippi River foreshore dike on the downstream side of the Neptune Pass inlet. The revised design of the structure includes varying extension distances, crown elevations, crown widths, river side slopes, and land side slopes along the alignment. The structure alignment would be shifted slightly riverward, side slopes of the structure would be shallower, and there would be an overall reduction in area of the stone paving on the pass side of the structure. Based on geotechnical borings and analysis, shallower slopes and slight shift in alignment are needed to achieve acceptable factors of safety. The elevation crown notch would be shifted downstream to the narrower part of the existing bank line ridge with an elevation of -26 feet. The crown elevation would be -8 feet extending toward both banks, replacing areas that were previously at a +5 feet elevation (i.e., inlet structure original design). The cross-sectional area at the inlet to Neptune Pass has increased from 7,200 square feet to 10,300 square feet for Phase 1. There would be an elevation transition slope of 1 vertical on 2 horizontal (1V:2H) between the design elevations. The structure would cover approximately 331,700 square feet and be constructed with approximately 330,200 tons of stone. A 3-foot-thick layer of stone paving scour protection would cover approximately 42,700 square feet requiring approximately 7,700 tons of stone and would be placed approximately 325 feet into the pass from the crown of the structure. The alignment and design are listed below in Table 1. Refer to final EA #589: Figure 2 shows the revised design inlet structure feature; and Figure 3 shows a side scan rendition of the revised design inlet structure.

Table 1. Revised Design Inlet Structure Specifications.

Feature Length (ft)[5]	Crown Elevation (ft)	Crown Width (ft)	River Side Slope (V:H)	Land Side Slope (V:H)
195	+5	5	1:2	1:3
272	-8	50	1:2.5	1:2.5
148	-8	50	1:3	1:2.5
91	-26	115	1:2	1:2

[3] Draft EA #589 - The target flow of original inlet structure was approximately 80,000 cfs at a Mississippi River flow of 1 million cfs.

[4] Draft EA #589 – Inlet Structure original design:

- Center of the structure – 100-foot-wide notch at an elevation of -26 feet and a 115-foot-wide crown.
- Side slopes adjacent to center notch – 1V:2H slope to an elevation of -8 feet and a 50-foot-wide crown extending 170 feet upstream and downstream.
- Structure side slopes – 1V:2H slope to an elevation of +5 feet and a 5-foot-wide crown tying into the upstream and downstream Mississippi River bank.
- Existing foreshore dike – capped with stone to match the tie in elevation of +5 feet.
- Inlet structure – tie into existing ground at a 1V:1.75H slope perpendicular to the Mississippi River bank.
- Inlet cross sectional area – reduced to approximately 7,200 square feet.
- Structure – constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds.
- Stone Paving scour protection – 3-foot-thick layer of approximately 20,000 tons of 1,200-pound stone placed approximately 325 feet into the pass from the crown of the structure.

[5] The feature length is the extension distance at a constant design template between the 1V:2H sloping transitions between the elevation changes.

Feature Length (ft)[5]	Crown Elevation (ft)	Crown Width (ft)	River Side Slope (V:H)	Land Side Slope (V:H)
143	-8	50	1:3	1:3
101	+5	5	1:2	1:3

Outlet Structures
The proposed Neptune Pass Outlet Structures would consist of multiple armored V-shaped SREDs placed between the -6 and -10-foot contour. Barge mounted excavators would be utilized to excavate earthen material from adjacent mud-bottoms and side cast material to create each SRED. It is expected that a total of approximately 520,000 cubic yards of earthen material would be required for construction of the SREDs. The SREDs would have a five-foot top width and would be constructed to a target elevation of +5.0 feet, with side slopes of 1V:2H. Each SRED would consist of multiple terraces that are 300 feet long with 100-foot gaps between each terrace. The SREDs would also require placement of approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile. All work would be via floating plant. Placement of stone would be via barge mounted excavator or dragline. Refer to final EA #589: Figure 5 shows a rendition of the approximate proposed location of the outlet structures (SREDs).

SITE ACCESS: All work will be via floating plant. Stone required for the proposed action will be discharged via barge mounted excavator or dragline positioned within Neptune Pass.

1. Review of Compliance (e230.10 (a)-(d))	Preliminary[1]		Final[2]	
A review of this project indicates that:				
a.) The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and information gathered for environmental assessment alternative);	[YES]	NO*	[YES]	NO
b.) The activity does not appear to: (1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the Clean Water Act; (2) jeopardize the existence of Federally listed endangered or threatened species or their habitat; and (3) violate requirements of any Federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies);	[YES]	NO*	[YES]	NO

c.) The activity will not cause or contribute to significant degradation of waters of the United States including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, esthetic, and economic values (if no, see section 2);

YES NO* YES NO

d.) Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5).

YES NO* YES NO

2. Technical Evaluation Factors (Subparts C-F).

a.) Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C).

	N/A	Not Significant	Significant*
1. Substrate impacts.		X	
2. Suspended particulates/turbidity impacts.		X	
3. Water column impacts.		X	
4. Alteration of current patterns and water circulation.		X	
5. Alteration of normal water fluctuations/hydro-period		X	
6. Alteration of salinity gradients		X	

b.) Biological Characteristics of the Aquatic Ecosystem (Subpart D).

	N/A	Not Significant	Significant
1. Effect on threatened/endangered species and their habitat.		X	
2. Effect on the aquatic food web.		X	
3. Effect on other wildlife (mammals, birds, reptiles, and amphibians).		X	

c). Special Aquatic Sites (Subpart E).

	N/A	Not Significant	Significant
1. Sanctuaries and refuges.	X		
2. Wetlands.		X	
3. Mud flats.		X	
4. Vegetated shallows.		X	
5. Coral reefs	X		
6. Riffle and pool complexes	X		

d.) Human Use Characteristics (Subpart F).

	N/A	Not Significant	Significant
1. Effects on municipal and private water supplies.	X		
2. Recreational and commercial fisheries impacts.	X		
3. Effects on water-related recreation.	X		

4. Aesthetic impacts.	X		
5. Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.	X		

Remarks: Where a check is placed under the significant category, preparer has attached explanation.

3. Evaluation of Dredged or Fill Material (Subpart G).[3]

a.) The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material.

1. Physical characteristics X
2. Hydrography in relation to known or anticipated sources of contaminants X
3. Results from previous testing of the material or similar material in the vicinity of the project X
4. Known, significant sources of persistent pesticides from land runoff or percolation X
5. Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances X
6. Other public records of significant introduction of contaminants from industries, municipalities, or other sources X
7. Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities X
8. Other sources (specify) .....

Appropriate references:

1. Coastal Protection and Restoration Authority (CPRA) of Louisiana. 2022. Coastwide Reference Monitoring System – Wetlands Monitoring Data. Retrieved from Coastal Information Management System (CIMS) database. http://cims.coastal.louisiana.gov. Accessed June 2022.

2. Louisiana Department of Environmental Quality. 1996. State of Louisiana Water Quality Management Plan, Water Quality Inventory. Appendices A and B. Baton Rouge, Louisiana.

3. Louisiana Department of Environmental Quality (LDEQ). 2024. State of Louisiana Water Quality Management Plan Water Quality Inventory Integrated Report (Section 305(b) and 303(d) Reports) and List of Impaired Water Bodies: Including EPA's Additions. https://deq.louisiana.gov/page/579. Last Accessed, August 2, 2024.

4. Natural Resources Conservation Service, U.S. Department of Agriculture. Web Soil Survey. Available online. Accessed June 2022.

5. U.S. Geological Survey (USGS). 2006. Latest Land Change Estimates for Louisiana Coast. Online, http://www.usgs.gov/newsroom/article_pf.asp?ID=1568.

6. U.S. Army Corps of Engineers (USACE). CEMVN EDH. 2023. Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure.

a) An evaluation of the appropriate information in reference 3 above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or the material meets the testing exclusion criteria.

YES NO

4. Disposal Site Delineation (e230.11(f))
a) The following factors, as appropriate, have been considered in evaluating the disposal site.

1. Depth of water at disposal site X
2. Current velocity, direction, and variability at disposal site X
3. Degree of turbulence* X
4. Water column stratification X
5. Discharge vessel speed and direction X
6. Rate of discharge X
7. Dredged material characteristics (constituents, amount, and type of material, settling velocities X
8. Number of discharges per unit of time X
9. Other factors affecting rates and patterns of mixing (specify)..... ____

*The Mississippi River is perpetually a turbid river. Any on-site erosional discharges that would occur during construction activities would have relatively minor effects to the overall turbidity of the river.

Appropriate references: Same as 3(a)

b) An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

YES NO*

5. Actions to Minimize Adverse Effects (Subpart H)

All appropriate and practicable steps have been taken, through application of the recommendations of 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

YES NO*

6. Factual Determination (230.11)

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term (adverse) environmental effects of the proposed discharge as related to:

a) Physical substrate at the disposal site (review sections 2a, 3, 4, and 5 above).	YES	NO*
b) Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5).	YES	NO*
c) Suspended particulates/turbidity (review sections 2a, 3, 4, and 5).	YES	NO*
d) Contaminant availability (review sections 2a, 3, and 4).	YES	NO*
e) Aquatic ecosystem structure and function (review sections 2b, 2c, 3, and 5).	YES	NO*
f) Disposal site (review sections 2, 4, and 5).	YES	NO*
g) Cumulative impact on the aquatic ecosystem.	YES	NO*
h) Secondary impacts on the aquatic ecosystem.	YES	NO*

*A negative, significant, or unknown response indicates that the proposed project may not be in compliance with the Section 404(b)(1) Guidelines.

[1]Negative responses to three or more of the compliance criteria at this stage indicates that the proposed project may not be evaluated using this "short form procedure". Care should be used in assessing pertinent portions of the technical information of items 2a-d, before completing the final review of compliance.

[2]Negative responses to one of the compliance criteria at this stage indicates that the proposed project does not comply with the guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the "short form" evaluation process is inappropriate.

[3]If the dredged or fill material cannot be excluded from individual testing, the "short form" evaluation process is inappropriate.

7. Evaluation Responsibility.

Evaluation prepared by: Mark H. Lahare

Name: Mark H. Lahare
Position: Environmental Protection Specialist
Organization: CEMVN RPEDS PDC-C
Date: February 10, 2025.

Evaluation reviewed by: Michael Brown

Name: Michael T. Brown
Position: Supervisory Environmental Resources Specialist
Organization: CEMVN RPEDS PDC-C
Date: February 11, 2025

8. Findings

a.) The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines

b.) The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions:

c.) The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):

1. There is a less damaging practicable alternative
2. The proposed discharge will result in significant degradation of the aquatic ecosystem
3. The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem

12 FEB 2025
Date

Mark R. Smith
Chief, Environmental Compliance Branch

JOHN BEL EDWARDS
GOVERNOR

THOMAS F. HARRIS
SECRETARY

State of Louisiana

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF COASTAL MANAGEMENT

June 18, 2024

Mark R. Smith
Chief, Environmental Compliance Branch
Corps of Engineers- New Orleans District
7400 Leake Avenue
New Orleans, LA 70118
Via email: Mark.R.Smith@usace.army.mil

RE: **C20220079 with Mod 03,** Coastal Zone Consistency
New Orleans District, Corps of Engineers
Direct Federal Action
Neptune Pass Rock Closure Project (C20220079) with Modification 03 for Redesign and Addition of Features
Plaquemines Parish

Dear Mr. Smith:

The above referenced project has been reviewed for consistency with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in this application, is consistent with the LCRP.

If you have any questions concerning this determination please contact Jim Bondy of the Consistency Section at (225) 342-3870 or james.bondy@la.gov.

Sincerely,

/S/ Charles Reulet
Administrator
Interagency Affairs/Field Services Division

CR/MH/jab

cc: Mark Lahare, COE-NOD
Dave Butler, LDWF

JEFF LANDRY
GOVERNOR

TYLER PATRICK GRAY
SECRETARY

KEITH LOVELL
ASSISTANT SECRETARY

State of Louisiana

DEPARTMENT OF ENERGY AND NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT

August 30, 2024

Mark R. Smith
Chief, Environmental Compliance Branch
Corps of Engineers- New Orleans District
7400 Leake Avenue
New Orleans, LA 70118
Via email: Mark.R.Smith@usace.army.mil

RE: **C20220079 with Mod 04,** Coastal Zone Consistency
New Orleans District, Corps of Engineers
Direct Federal Action
Neptune Pass Rock Closure Project Mod 04 - Additional Re-Design of the Neptune Pass and Quarantine Bay Flow Control Features
Plaquemines Parish

Dear Mr. Smith:

The above referenced project has been reviewed for consistency with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, as amended. The modification, as proposed, is consistent with the LCRP.

If you have any questions concerning this determination please contact Jim Bondy of the Consistency Section at (225) 342-3870 or james.bondy@la.gov.

Sincerely,

/S/ Charles Reulet
Administrator
Interagency Affairs/Field Services Division

CR/MH/jab

cc: Mark Lahare, COE-NOD
Dave Butler, LDWF

JOHN BEL EDWARDS
GOVERNOR

CHUCK CARR BROWN, PH.D.
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

3/21/2024
MODIFIED

SEP 01 2022

Mr. Tyler Stevens
US Army Corps of Engineers, New Orleans District
7400 Leake Avenue
New Orleans, Louisiana 70118

AI No.: 235366 WQC 220830-02 CER20240001
Activity No.: CER20220001
Valid as Proposed

RE: Mississippi River, Baton Rouge to the Gulf of Mexico, Neptune Pass Rock Closure
Water Quality Certification WQC 220830-02
New Orleans District

Dear Mr. Stevens::

The Louisiana Department of Environmental Quality, Water Permits Division (LDEQ), has reviewed the application for the Neptune Pass rock closure within the New Orleans District.

The information provided in the application has been reviewed in terms of compliance with State Water Quality Standards, the approved Water Quality Management Plan and applicable state water laws, rules and regulations. LDEQ determined that the requirements for a Water Quality Certification have been met. LDEQ concludes that the discharge of fill will not violate water quality standards as provided for in LAC 33:IX.Chapter 11. Therefore, LDEQ hereby issues US Army Corps of Engineers, New Orleans District – Mississippi River, Baton Rouge to the Gulf of Mexico, Neptune Pass Rock Closure Water Quality Certification, WQC 220830-02.

Should you have any questions concerning any part of this certification, please contact Elizabeth Hill at (225) 219-3225 or by email at elizabeth.hill@la.gov. Please reference Agency Interest (AI) number 235366 and Water Quality Certification 220830-02 on all future correspondence to this Department to ensure all correspondence regarding this project is properly filed into the Department's Electronic Document Management System.

Sincerely,

Scott Guilliams
Administrator
Water Permits Division

c: IO-W

ec: tyler.stevens@usace.army.mil

United States Department of the Interior

FISH AND WILDLIFE SERVICE
200 Dulles Drive
Lafayette, Louisiana 70506

February 12, 2025

Colonel Jones
District Engineer
U.S. Army Corps of Engineers
New Orleans District
7400 Leake Avenue
New Orleans, LA 70118-3651

Dear Colonel Jones:

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South has proposed the Neptune Pass Closure Project, an emergency action, located on the left descending bank of the Mississippi River in Plaquemines Parish, Louisiana, at Mississippi River (MR) mile 24 above Head of Passes. The proposed project would eliminate a navigational hazard in the Mississippi River. The Fish and Wildlife Service (Service) provides this final report in accordance with the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); which constitutes the final report of the Secretary of the Interior as required by Section 2(b) of that Act. A copy of this report has been sent to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS); their comments have been addressed in this final FWCA Report.

According to information provided by the USACE, Neptune Pass has rapidly enlarged and is currently discharging roughly 16 percent of the Mississippi River's flow. That water is being discharged into Quarantine Bay, an arm of Breton Sound. The increasing flow being diverted from the Mississippi River through Neptune Pass following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside Neptune Pass, especially if no action is taken.

Description of Alternative Investigated

In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed further in this revised EA.

In August 2024, the USACE released draft EA #589 and associated FONSI initiating the 30-day public and agency review period (August 2, 2024, to September 3, 2024). During the public review period, the USACE received letters of support as well as critical feedback from both the public and

non-governmental organizations regarding the proposed action, specifically the design of the Neptune Pass Flow Reduction Structures (Inlet and Outlet structures). In response to requests for additional modeling information associated with the Inlet and Outlet structures, the USACE released the draft November 2023 Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure, prepared by the USACE, Engineering Division, Hydrology, Hydraulics, and Coastal Engineering Branch and Lower Mississippi River and Tributaries Engineering Branch. The 2023 modeling report stated that it was based on the project design as of November 2023 and that the report may be revised/updated in the event of future proposed design changes. At that time, the proposed project was still in the Engineering and Design Phase for both the Inlet Structure and Outlet structures. More specifically, the USACE was in the Geotechnical Design Phase and actively incorporating geotechnical information into the design of the project features. In December 2024, the USACE completed the Geotechnical Design Phase and has since revised the proposed action. The proposed action design changes from the August 2024 draft to this final EA #589 are further described in *Revised Proposed Action*.

Revised Proposed Action

Neptune Pass Flow Reduction Structures

(All elevations referenced for the proposed action structures are to North American Vertical Datum 1988 (NAVD88) (epoch 2004.65), unless otherwise noted).

The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of Mexico from continuing to grow. The proposed action comprises two features that would work together to provide a sustainable solution to remove the hazard. There would be stone placed to raise the existing riverbank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There would be Sediment Retention Enhancement Devices (SREDs) built with earthen material excavated from adjacent mud-bottoms, as well as placement of geotextile fabric and stone riprap. The SREDs would be constructed at the outlet of Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features would be placed in navigable water.

Based upon geotechnical analysis completed in December 2024, the USACE determined that a phased construction approach of the inlet and outlet structures was warranted to further assess the real time effects on navigation during periods of high river flow and to be able to plan efficient and cost effective follow up actions, as needed. The proposed phased construction and real time monitoring approach would include the following:

- Phase 1 – construction of a modified, less restrictive stone inlet structure at the at the entrance of Neptune Pass that is similar to the proposed structure as described in draft EA #589.
- If warranted, Phase 2 – raise the Phase 1 stone structure to further reduce the cross-sectional area of the entrance of Neptune Pass.

- If warranted, Phase 3 – construct the outlet structures (i.e., Sediment Retention Enhancement Devices (SREDs)) in a modified configuration. The SREDs would be designed to increase the elevations in Quarantine Bay at the outlet of Neptune Pass to back up the flow and decrease the flow capacity. The SREDs would consist of dredged material, stone, geotextile, wooden piles, or a combination of these options.
- Upon completion of each phase of construction, multibeam surveys and flow measurements will be conducted routinely to assess the effects to bathymetry and flow in Neptune Pass and the Mississippi River. Post construction of the inlet structure, the USACE will engage with the navigation industry to determine any positive or negative real time effects on navigation.

The modeled flow after Phase 1 construction of the revised design inlet structure is expected to be approximately 125,000 cubic feet per second (cfs) at a Mississippi River flow of 1 million cfs. If Phase 2 and Phase 3 are constructed, once those features are complete, the target flow is expected to be approximately 80,000 cfs at a Mississippi River flow of 1 million cfs. Figure 1 shows the project area with inlet and outlet structures. The target flow of original inlet structure was approximately 80,000 cfs at a Mississippi River flow of 1 million cfs.

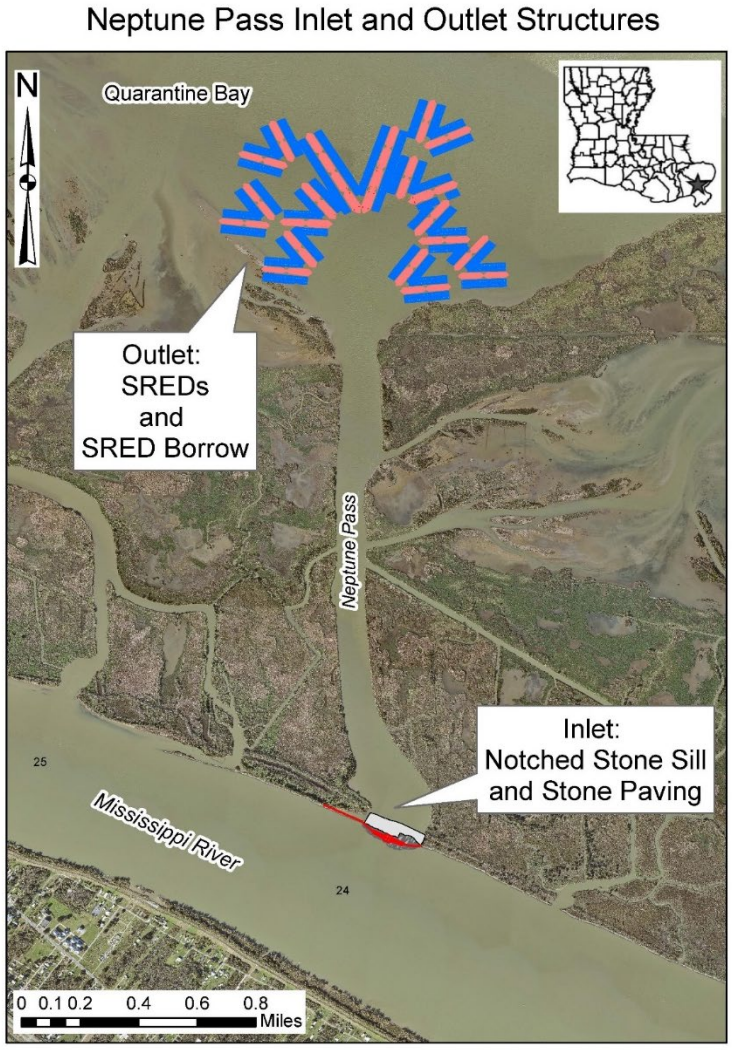

Figure 1. Neptune Pass Project Features.

Inlet Structure – Revised Design

The proposed Neptune Pass Inlet Structure is a stone sill that would reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure would begin with a tie in at the end of the Mississippi River foreshore dike on the upstream side of the Neptune Pass inlet and would end with a tie in at the end of the Mississippi River foreshore dike on the downstream side of the Neptune Pass inlet. The revised design of the structure includes varying extension distances, crown elevations, crown widths, river side slopes, and land side slopes along the alignment. The structure alignment would be shifted slightly riverward, side slopes of the structure would be shallower, and there would be an overall reduction in area of the stone paving on the pass side of the structure. Based on geotechnical borings and analysis, shallower slopes and slight shift in alignment are needed to achieve acceptable factors of safety. The elevation crown notch would be shifted downstream to the narrower part of the existing bank line ridge with an elevation of -26 feet. The crown elevation would be -8 feet extending toward both banks, replacing areas that were previously at a +5 feet elevation (i.e., inlet structure original design). The cross-sectional area at the inlet to Neptune Pass has increased from 7,200 square feet to 10,300 square feet for Phase 1. There would be an elevation transition slope of 1 vertical on 2 horizontal (1V:2H) between the design elevations. The structure would cover approximately 331,700 square feet and be constructed with approximately 330,200 tons of stone. A 3-foot-thick layer of stone paving scour protection would cover approximately 42,700 square feet requiring approximately 7,700 tons of stone and would be placed approximately 325 feet into the pass from the crown of the structure. The alignment and design are listed below in Table 1. Figure 2 shows the revised design inlet structure feature. Figure 3 shows a side scan rendition of the revised design inlet structure.

The previous design had the center of the structure with a 100-foot-wide notch at an elevation of -26 feet with a 115-foot-wide crown. Side slopes adjacent to center notch were 1V:2H slope to an elevation of -8 feet and a 50-foot-wide crown extending 170 feet upstream and downstream. The structure side slopes were 1V:2H slope to an elevation of +5 feet and a 5-foot-wide crown tying into the upstream and downstream Mississippi River bank. The existing foreshore dike was capped with stone to match the tie in elevation of +5 feet.

Table 1. Revised Design Inlet Structure Specifications.

Feature Length (ft)	Crown Elevation (ft)	Crown Width (ft)	River Side Slope (V:H)	Land Side Slope (V:H)
195	+5	5	1:2	1:3
272	-8	50	1:2.5	1:2.5
148	-8	50	1:3	1:2.5
91	-26	115	1:2	1:2
143	-8	50	1:3	1:3
101	+5	5	1:2	1:3

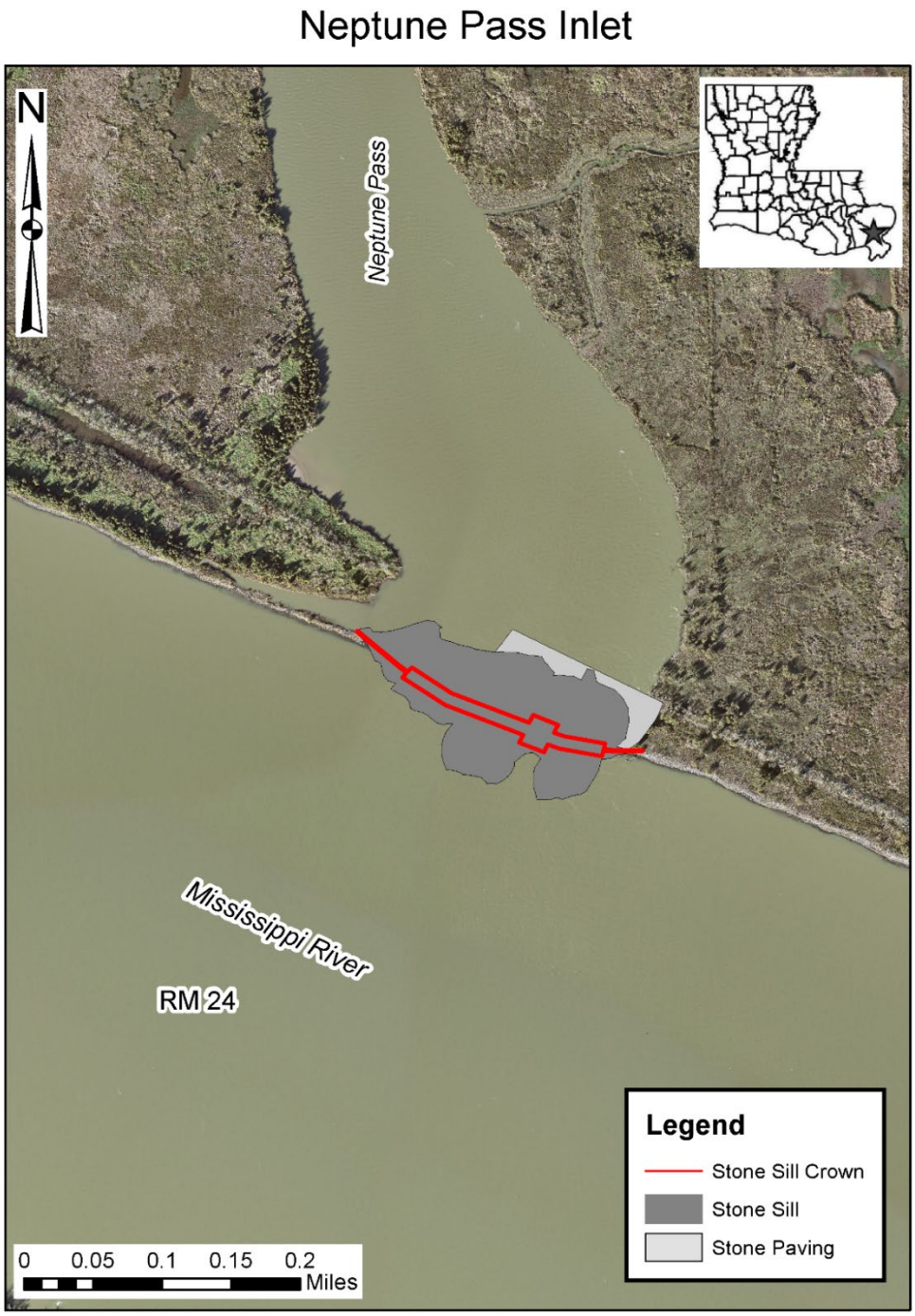

Figure 2. Inlet Structure - Revised Design.

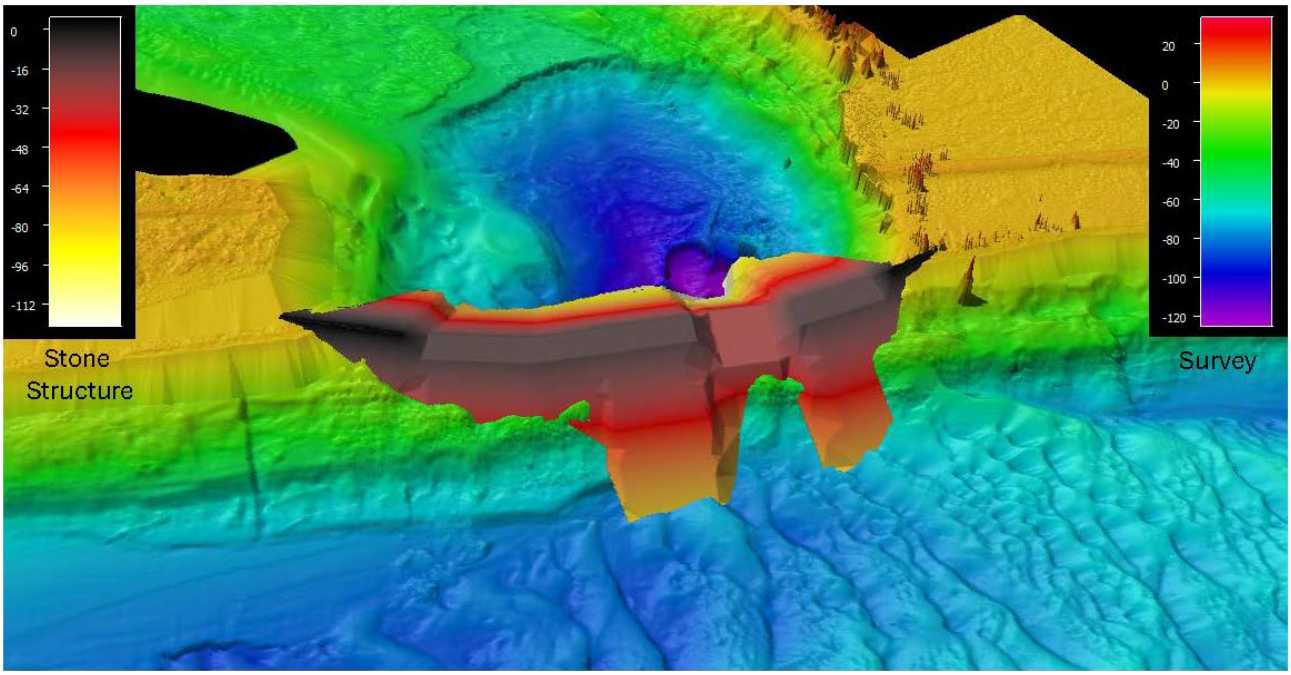

Figure 3. Side scan rendition of Inlet Stone Sill.

Outlet Structures

The proposed Neptune Pass Outlet Structures would consist of multiple armored V-shaped SREDs placed between the -6 and -10-foot contour. Barge mounted excavators would be utilized to excavate earthen material from adjacent mud-bottoms and side cast material to create each SRED. It is expected that a total of approximately 520,000 cubic yards of earthen material would be required for construction of the SREDs. The SREDs would have a five-foot top width and would be constructed to a target elevation of +5.0 feet, with side slopes of 1V:2H. Each SRED would consist of multiple terraces that are 300 feet long with 100-foot gaps between each terrace. The SREDs would also require placement of approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile. All work would be via floating plant. Placement of stone would be via barge mounted excavator or dragline. Figure 4 shows the outlet structure features (SREDs). Figure 5 shows a rendition of the approximate proposed location of the outlet structures (SREDs).

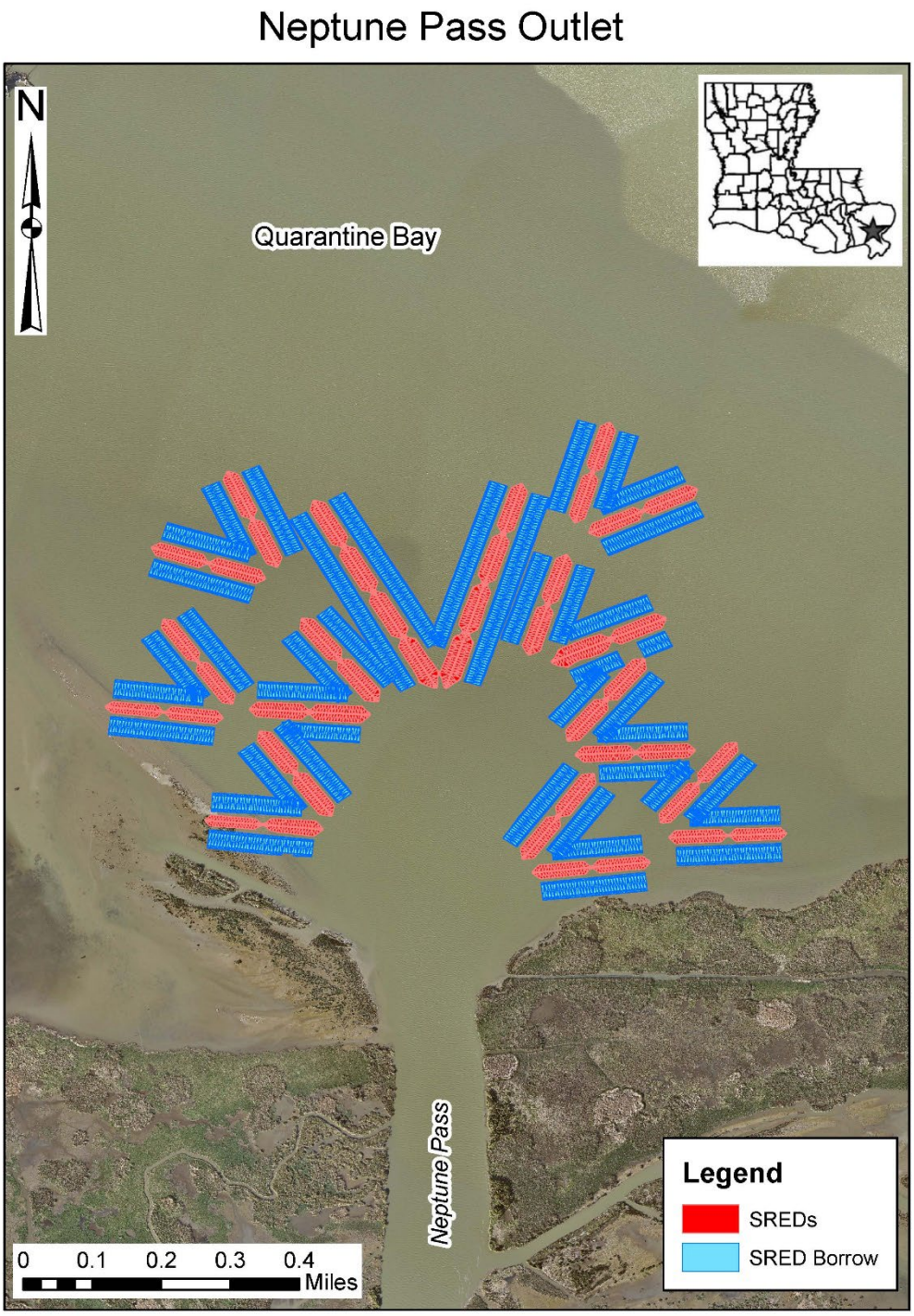

Figure 4. Outlet Structure Features.

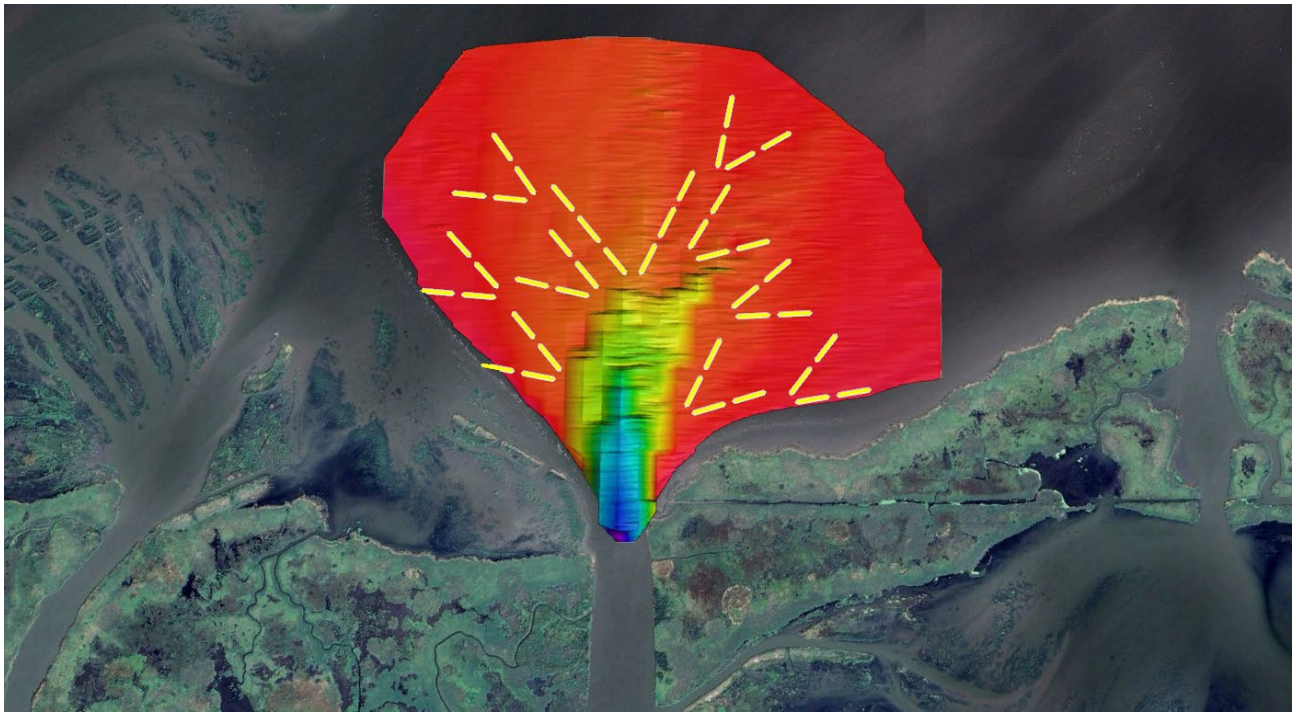

Figure 5. Rendition of approximate location(s) and V-shaped design of Outlet SREDS in Quarantine Bay.

Fish and Wildlife Resources

Breton Sound Basin exhibits an increasing salinity gradient, including freshwater wetlands in the uppermost basin and in the location of existing breaches along the east bank of the Mississippi River, intermediate marsh, followed by brackish habitats, and then saline marshes towards the Gulf of Mexico. Neptune Pass is one of the existing breaches along the east bank of the river located between Mardi Gras Pass and Fort St. Philip. The project area consists of open water with adjacent fresh to intermediate marsh habitat. These wetlands are strongly influenced by freshwater discharges from the Mississippi River and associated distributary outlets.

Wetland Habitats

Based on the August 2022 site visit, the project area freshwater marsh community consists of cattail (*Typha latifolia*), arrowhead (*Sagittaria latifolia*), bulltongue (*Sagittaria lancifolia*), willow (*Salix nigra*), cut grass (*Leersia hexandra*), and deer pea (*Vigna luteola*). The wetlands of the Breton Sound Basin are enormously high in biological productivity (Day et al. 1982). They serve as vital nursery areas for fish and shellfish (Van Sickle et al. 1976) and wildlife habitat (Lowery 1974). Wetlands provide plant detritus to adjacent coastal waters and thereby contribute to the production of commercially and recreationally important fishes and shellfishes.

Open water habitat of the project area includes the deep water of Neptune Pass and the shallow water at the outlet. Submerged aquatic vegetation (SAV) is interspersed and can include water hyacinth (*Eichhornia crassipes*), alligator weed (*Alternanthera philoxeroides*), coontail (*Ceratophyllum demersum*), wild celery (*Vallisneria Americana*), widgeon grass (*Ruppia maritime*), southern naiad (*Najas guadalupensis*), and Eurasian watermilfoil (*Myriophyllum spicatum*). SAV has been described as “the most significant form of complex cover for aquatic animals” (LDWF

2015) that provide valuable ecosystem services (Chabreck 1972; Hillmann et al. 2018). SAV beds support aquatic populations and a diverse biota, serve as habitat and nursery grounds for fish and shellfish, export organic matter and nutrients into the water column, oxygenate the water column, and stabilize bottom sediments by reducing current velocity and wave energy.

Fisheries and Essential Fish Habitat

The Breton Basin supports fresh, estuarine, and marine fishes and shellfishes. The project area will be dominated by freshwater fishes include largemouth bass, crappie, bluegill, redear sunfish, red-spotted sunfish, channel catfish, blue catfish, yellow bullhead, freshwater drum, bowfin, carp, buffaloes, and gars. The crustaceans expected to occur in the project area include white shrimp, brown shrimp, and blue crab.

The proposed project is located within an area identified as Essential Fish Habitat (EFH) by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, Magnuson-Stevens Act; P.L. 104-297). The open waters, water-bottom substrates, and inter-tidal marshes of the Neptune Pass Rock Closure project area are considered EFH under the estuarine component. These habitats are used by several federally managed species for foraging and nursery habitat, as well as a migration route to other areas considered to be EFH. The USACE should consult with the NMFS regarding EFH.

Wildlife

The project area provides important habitat for numerous species of wildlife, including waterfowl, wading birds, shorebirds, neotropical migratory birds, mammals, reptiles, and amphibians. Around 283 species of breeding, transient, and nonbreeding species of birds have been recorded in Plaquemines Parish from 2022-2023 (Cornell Lab of Ornithology 2020). The Breton South Basin wetlands support a variety of birds including millions of neotropical migrants and other resident and migratory avian species such as rails, coots, gallinules, shorebirds, wading birds, waterfowl, hawks, owls, and numerous other land birds (including warblers, sparrows, thrushes, vireos, buntings, flycatchers, chickadees, titmouse, wrens, and swallows). Louisiana coastal wetlands provide neotropical migratory birds essential stopover habitat where they can forage and rest, and these coastal habitats provide nesting habitat for hundreds of thousands of birds each year.

Mammals known to occur in the project-area wetlands include manatee, dolphin, mink, raccoon, nutria, river otter, muskrat, nine-banded armadillo, Virginia opossum, cotton mouse, house mouse, hispid cotton rat, eastern cottontail rabbit, swamp rabbit, fox squirrel, grey squirrel, bobcat, and white-tailed deer (Lowery 1974; O'Neil and Linscombe 1975).

Amphibians such as the southern dusky salamander (*Desmognathus fuscus*), dwarf salamander (*Eurycea quadridigitata*), eastern newt (*Notophthalmus viridescens*), three-toed amphiuma (*Amphiuma tridactylum*), lesser siren (*Siren intermedia*), Gulf coast toad (*Incilius nebulifer*), northern cricket frog (*Acris crepitans*), green tree frog (*Hyla cinerea*), squirrel tree frog (*Hyla squirella*), spring peeper (*Pseudacris crucifer*), eastern narrow-mouthed toad (*Gastrophryne carolinensis*), bullfrog(*Lithobates catesbeianus*), green frog (*Lithobates clamitans*), pig frog (*Lithobates grylio*), and southern leopard frog (*Lithobates sphenocephalus*) are expected to occur in freshwater upper basin project-area wetlands (Dundee and Rossman 1989).

Reptiles such as the American alligator (*Alligator mississipppiensis*), diamondback terrapin, eastern mud turtle (*Kinosternon subrubrum*), red-eared slider (*Trachemys scripta*), alligator snapping turtle

(*Macroclemys temminckii*), green anole (*Anolis carolinensis*), broadhead skink (*Plestiodon laticeps*), eastern black kingsnake (*Lampropeltis nigra*), rat snake (*Elaphe obsoleta*), Gulf Coast ribbon snake (*Thamnophis proximus orarius*), cottonmouth (*Agkistrodon piscivorus*), common garter snake (*Thamnophis sirtalis*), and water snakes (*Nerodia* spp.) are expected to occur in the project-area wetlands (Dundee and Rossman 1989). American alligator abundance has been increasing in the upper portions of the basin and declining in the lower portions, but overall has declined as the preferred fresh marsh and intermediate marsh has converted to brackish marsh.

Endangered and Threatened Species

The Service maintains our concurrence with the USACE's determination (reference the USACE's April 17, 2024, determination letter (Project Code 2024-0078257)) that the activities proposed for the Neptune Pass Project are not likely to adversely affect any listed or proposed threatened or endangered species or their critical habitat. No further Endangered Species Act consultation with the Service will be required for the proposed project unless one of the following conditions are met: 1) the scope or location of the proposed project is changed significantly; 2) new information reveals that the action may affect listed species or designated critical habitat; 3) the action is modified in a manner that causes effects to listed species or designated critical habitat; or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in the original consultation should occur before changes are made and/or finalized.

Migratory Bird Treaty Act and Bald and Golden eagle Protection Act

There are several species found throughout the Breton Basin that are protected under the Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.) and/or the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d), including bald eagle, brown pelican, other colonial nesting birds, and most native bird species.

Colonial nesting birds

The proposed Project would be located in an area where colonies of nesting waterbirds may be present. Based on the LDWF's 2022 nesting colony survey data, the Breton South Basin has supported nearly 60 colonies since the early 1980s. Colonies may be present that are not currently listed in the database maintained by the LDWF. Though the waterbird colony database is extensive and updated often, colony nesting site locations are very fluid, particularly, in marsh habitats where late nesters or new colonies can be established between surveys. Due to the difficult nature of documenting all nesting colonies, the Service recommends that a qualified biologist inspect the proposed construction site for the presence of documented and undocumented nesting colonies during the nesting season of each year that project construction is ongoing.

To minimize disturbance to colonial nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills, anhingas, and cormorants), all construction activity occurring within 1,000 feet of a nesting colony should be restricted to the non-nesting period (i.e., September 1 through February 15, exact dates may vary within this window depending on species present). If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the USACE should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies. In addition, during construction activities we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and their nests and how to avoid disturbance of birds and their colonies.

Brown pelicans were delisted (due to recovery) on December 17, 2009, and are no longer protected under the ESA, but they are still protected by the MBTA. Brown pelicans may occasionally feed in the shallow estuarine waters found within the Project Area. Brown pelican colonies are known to nest on Breton Isle in southern Breton Sound.

Bald Eagle
Forested wetlands may provide nesting habitat for the bald eagle, which was officially removed from the List of Endangered and Threatened Species as of August 8, 2007. However, the bald eagle remains protected under the MBTA and BGEPA. Based on LDWF bald eagle nesting survey data, 8 eagle nests have been detected on the east side of the river in Orleans, St. Bernard, and Plaquemines parishes, although no known eagle nest occurs within the project footprint. Because eagles may build new nests each nesting season, we recommend contractors be mindful of nesting eagles during project construction. Bald eagles typically nest in large trees located near coastlines, rivers, or lakes that support adequate foraging from October through mid-May. In southeastern Louisiana parishes, eagles typically nest in mature trees (i.e., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water.

During project construction, on-site personnel should be informed of the possible presence of nesting bald eagles near the project boundary, and should identify, avoid, and immediately report any such nests to this office. If an active or inactive eagle nest is discovered within 2 miles of the project footprint, the applicant should follow the bald and golden eagle guidelines found on-line at https://www.fws.gov/program/eagle-management to determine whether disturbance will occur and/or an incidental take permit is needed.

At-Risk Species
The Service's Southeast Region has defined "at-risk species" as those that are: 1) proposed for listing under the ESA by the Service; 2) candidates for listing under the ESA, which means the species has a "warranted but precluded 12-month finding"; or 3) petitioned for listing under the ESA, which means a citizen or group has requested that the Service add them to the list of protected species. Petitioned species include those for which the Service has made a substantial 90-day finding as well as those that are under review for a 90-day finding. As the Service develops proactive conservation strategies with partners for at-risk species, the states' Species of Greatest Conservation Need (defined as species with low or declining populations) will also be considered. See Table 1 for a list of at-risk species; the column with their common name contains a link to additional information on the species. Please utilize the links to find further information on each species and/or contact the Louisiana Ecological Services Office for additional information.

Table 2. At-Risk species that maybe found in the Neptune Pass Project Area.

Species Common Name	**Scientific Name**	**Taxa**
Golden-winged warbler	*Vermivora chrysoptera*	Bird
Coastal (Wayne's) black-throated green warbler	*Setophaga virens waynei*	Bird
Lake Sturgeon	*Acipenser fulvescens*	Fish
American bumble bee	*Bombus pensylvanicus*	Insect
Monarch butterfly	*Danaus plexippus*	Insect

Species Common Name	Scientific Name	Taxa
Schoolhouse Springs leuctran stonefly	*Leuctra szczytkoi*	Insect
Southern plains bumble bee	*Bombus fraternus*	Insect
Variable cuckoo bumble bee	*Bombus variabilis*	Insect
Linda's Roadside Skipper	*Amblyscirtes linda*	Insect
Frosted elfin butterfly	*Callophrys irus*	Insect
Little Brown Bat	*Myotis lucifugus*	Mammal
Tricolored bat	*Perimyotis subflavus*	Mammal
Alabama hickorynut	*Obovaria unicolor*	Mussel
Eastern diamondback rattlesnake	*Crotalus adamanteus*	Reptile
Western chicken turtle	*Deirochelys reticularia miaria*	Reptile
Correll's false dragonhead	*Physostegia correllii*	Plant

Service Concerns

Land Building

Accreting deltaic wetlands, such as those found downstream of Neptune Pass, in Bay Denesse and adjoining marshes, provide valuable high-quality habitat for a variety of fish and wildlife including migratory waterfowl and commercially and recreationally important fish and shellfish. Because of the high rates of subsidence in these lower Mississippi River marshes, a continuous supply of suspended sediment is required to maintain marsh elevations and preclude marsh loss.

In the absence of the proposed action (future without project [FWOP]), flow through Neptune Pass would remain unaltered, potentially resulting in the continuation of land building and subsequent vegetative establishment occurring within the bays adjacent to Neptune Pass. The Service recognizes sedimentation occurring within these bays maybe the result of the deposition of scoured material from within Neptune Pass. Based on USACE modeling, this diversion is considered sand lean, diverting a small concentration of sediment from the Mississippi River relative to the amount of water being diverted. It is a perched diversion over a deep part of the river where little sand is being transported. However, the Service also recognizes the difficulty in determining the source of land building material in the adjacent bays whether it be the deposition of scoured material from the eroding of Neptune Pass, as proposed by the USACE, or from other sources of suspended sediment transported by the river. For example, land building has been established in other areas of the Mississippi River delta with little to no influence from heavy sediment transport including the bay associated with Ostrica Pass located upriver of Neptune Pass as well as delta splays in the Fort St. Phillips area located downriver of Neptune Pass. Additionally, the bay associated with Caernarvon Pass is exhibiting land building which is located several miles upriver from Neptune Pass. While the Service does not disagree with the USACE's assumption that eroded material from Neptune Pass may have facilitated land building in the adjacent bay, we maintain the difficulty in attributing land building processes to the erosion of Neptune Pass alone as evident by land building in other areas of the river delta that are not necessarily sediment diversions.

Under the future with project (FWP), the cross-sectional area of the pass at the structure site will be reduced, substantially reducing the freshwater influence of the river and the sediment it transports. The Service expects that the splay-nourishing suspended sediment will continue to be maintained

through a combination of sediment that flows through the inlet structure while being captured with the outlet structure SREDs. The Service assumes, under FWP if all phases are built, that the deltaic splays built before construction of the Neptune Pass structure will be sustained (no growth and no loss) although the Service recognizes that this assumption may be conservative.

Although the Service assumes no loss of the deltaic splays in the adjacent bays, the Service is concerned that the existing deltaic splays may experience loss not predicted by the project impacts analysis. Consequently, the Service recommends that the project area is monitored annually post-construction to determine if existing splays impacted by the project are experiencing land loss. If monitoring indicates changes from the current conditions, then the need for mitigation will have to be assessed.

Salinity

Based on Coastwide Reference Monitoring System (CRMS) hydro station 0139 data, the project area is determined to be a fresh marsh with an average growing season salinity of 0.52 ppt which is located downriver of Neptune Pass (Figure 4). The Service has assumed that river water influence becomes more dominant in FWOP and expects project area salinities to drop which would continue to be favorable for the fresh marsh in the project area. However, under FWP, the cross-sectional area of the pass at the structure site will be reduced by 88 percent, substantially reducing the freshwater influence of the river. Accordingly, the Service assumes that project area salinities will increase throughout the project life. Although the Service assumes that the salinities may increase by 10 percent over the project life, it is possible that salinities in the project area may increase more than expected with greater seasonal influence. With rising sea levels and the reduced river influence in FWP, the Service is concerned about the detrimental effects that increased salinities and saltwater intrusion can have on the fresh marshes of the project area. Saltwater intrusion and increased salinities in the project area can alter plant species composition and extirpate species that require fresher environments (Visser et al. 1999; Neyland 2007). Due to Neyland's (2007) saltwater "burn" effect, plant species may be replaced by more salt tolerant halophytic plants. However, the colonization of halophytic vegetation after the removal of existing vegetation is not guaranteed, especially in high energy environments resulting in the loss of emergent marsh. Therefore, the Service recommends that the project area is monitored annually post-construction to determine if salinities increase beyond expected as well as to determine any changes in marsh types and/or accelerated marsh loss. If monitoring indicates changes from the existing conditions, then the need for mitigation will have to be assessed.

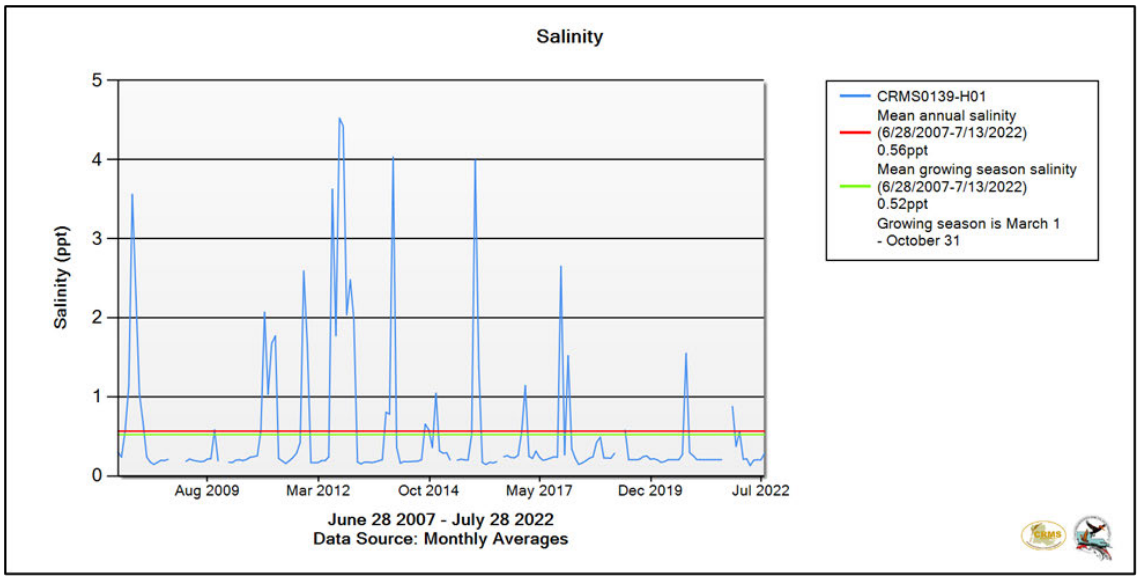

Figure 6. Mean annual and growing season water salinity (ppt) at the CRMS hydro station 0139-H01 located approximately 2.1 miles east (down river) of Neptune Pass.

Service Position and Recommendations

Coastal marshes are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries).

The Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981) identifies four resource categories that are used to ensure that the level of mitigation recommended by Service biologists will be consistent with the fish and wildlife resource values involved. Resource Category 2 are habitats of high value for evaluation species and are relatively scarce or becoming scarce on a national basis or in the ecoregion section. The mitigation goal for habitat in Resource Category 2 is that there should be no net loss of in-kind habitat value.

Project direct or indirect impacts to wetlands should be minimized to the greatest degree possible, and unavoidable impacts should be mitigated in a manner approved by the Service and other natural resource agencies. As proposed, the Neptune Pass Closure inlet and outlet structures would not directly impact wetlands and are assumed to result in no loss of the deltaic splays in the adjacent bays. Additionally, proper care should be taken to ensure that threatened, endangered, and at-risk species, as well as bald eagles and migratory birds will not be adversely affected.

After reviewing the proposed action, its impacts to fish and wildlife resources, and the need to eliminate a navigational hazard in the Mississippi River, the Service does not object to the Neptune Pass Project provided the following recommendations are included in the proposed action:

1. The Service recommends that the project area is monitored annually post-construction to determine if existing delta splays impacted by the project are experiencing land loss. If monitoring indicates changes from the current conditions, then the need for mitigation will have to be assessed.

2. The Service recommends that the project area is monitored annually post-construction to determine if salinities increase beyond expected as well as to determine any changes in marsh types and/or accelerated marsh loss. If monitoring indicates changes from the current conditions, then the need for mitigation will have to be assessed.
3. West Indian manatees occasionally enter Louisiana coastal waters and streams during the warmer months (i.e., June through September). During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and state law. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with manatees, although passively taking pictures or video would be acceptable. For more detail on avoiding contact with manatees refer to the Endangered and Threatened Species section of this document or contact this office.
4. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of project features and timing of construction. During project construction, a qualified biologist should inspect the proposed construction site for the presence of documented and undocumented wading bird nesting colonies and bald eagles.
    a. All construction activity during the wading bird nesting season (February through October 31 for wading bird nesting colonies, exact dates may vary) should be restricted within 1,000 feet of a wading bird colony. If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the USACE should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies.
    b. During construction activities, if a bald eagle nest is within or adjacent to the proposed project foot print, the applicant should follow the bald and golden eagle guidelines found on-line here to determine whether disturbance will occur and/or an incidental take permit is needed.
5. The Service recommends that the USACE contact the Service and the NMFS for additional ESA section 7 consultation if: 1) the scope or location of the proposed Project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat, 3) the action is modified in a manner that causes effects to listed species or designated critical habitat, or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in this consultation should occur before changes are made or finalized.

We appreciate the cooperation of your staff on the Neptune Pass Closure Project. Should your staff have any questions regarding this report, please contact Cathy Breaux (337-291-3122) of this office.

Sincerely,

Brigette D Firmin

Brigette D. Firmin
Field Supervisor
Louisiana Ecological Service Office

cc: Environmental Protection Agency, Dallas, TX
National Marine Fisheries Service, Baton Rouge, LA
Natural Resources Conservation Service, Alexandria, LA
LA Dept of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD), Baton Rouge, LA
Coastal Protection and Restoration Authority (CPRA), Baton Rouge, LA

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
200 Dulles Drive
Lafayette, Louisiana 70506

April 30, 2024

Colonel Jones
District Engineer
U.S. Army Corps of Engineers
New Orleans District
7400 Leake Avenue
New Orleans, LA 70118-3651

Dear Colonel Jones:

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South has proposed the Neptune Pass Closure Project, an emergency action, located on the left descending bank of the Mississippi River in Plaquemines Parish, Louisiana, at Mississippi River (MR) mile 24 above Head of Passes. The proposed project would eliminate a navigational hazard in the Mississippi River. The Fish and Wildlife Service (Service) provides this draft report in accordance with the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); however, it does not constitute the final report of the Secretary of the Interior as required by Section 2(b) of that Act. A copy of this report has been sent to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS); their comments, if any, will be addressed in our final FWCA Report.

According to information provided by the USACE, Neptune Pass has rapidly enlarged and is currently discharging roughly 16 percent of Mississippi River's flow. That water is being discharged into Quarantine Bay, an arm of Breton Sound. The increasing flow being diverted from the Mississippi River through Neptune Pass following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside Neptune Pass, especially if no action is taken.

Description of Alternative Investigated

There will be two features (Figure 1) that work together to provide a sustainable solution to remove the hazard to navigation. Stone will be placed to raise the existing riverbank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. Sediment Retention Enhancement Devices will be built with in-situ material at the outlet to Quarantine Bay to help retain water in Neptune Pass and reduce the velocity of water coming through the stone sill. All features will be placed in navigable waters. The target flow after construction is 80,000 cubic feet per second (cfs) at a Mississippi River flow of 1 million cfs.

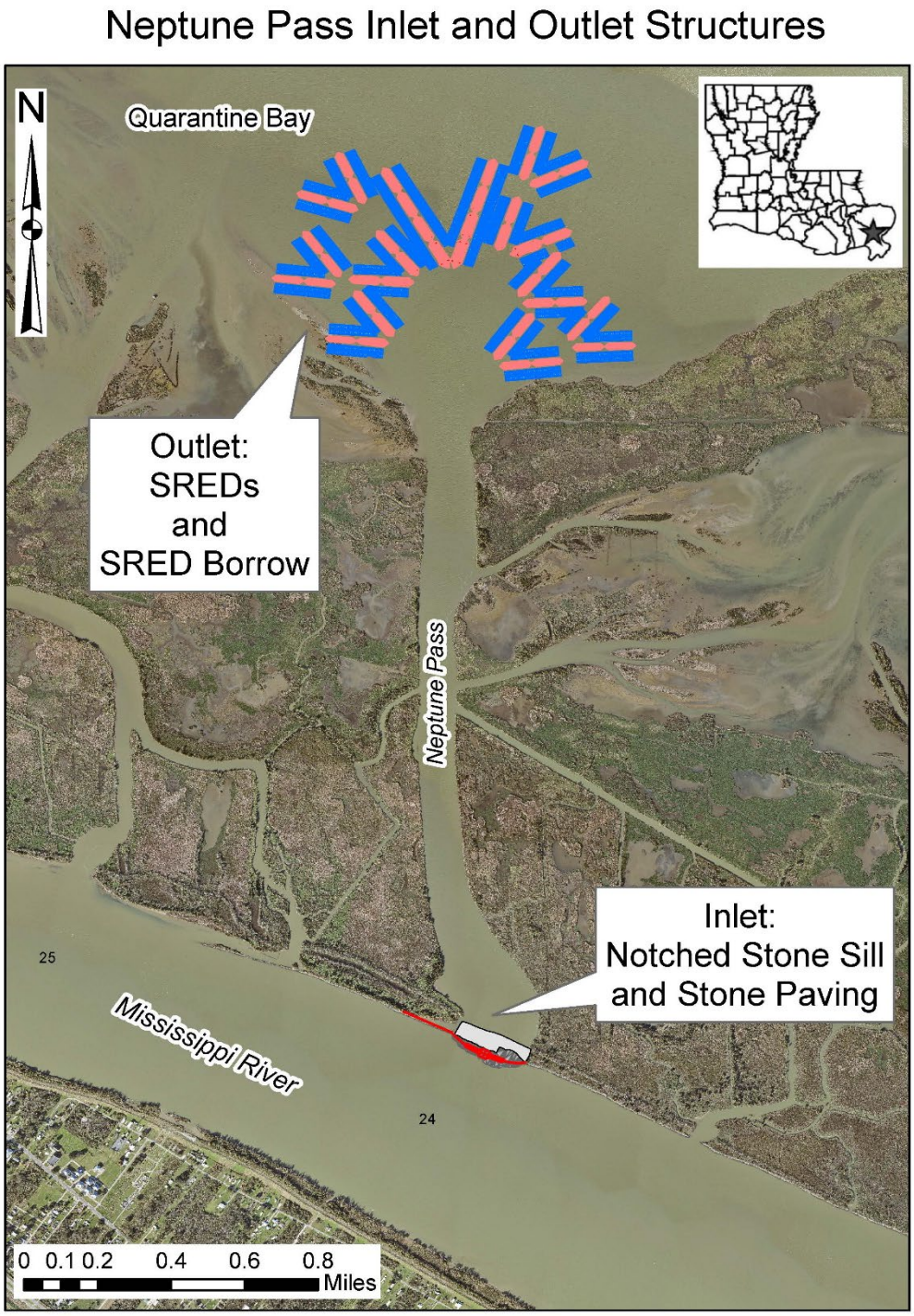

Figure 1. Neptune Pass Project Features.

Inlet Structure

The stone sill will reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure centerline will be curved to sit on top of the existing bank line sill at the confluence of the Mississippi River and Neptune Pass. The center of the structure will have a 100-foot-wide notch at an elevation of -26 feet with a 115-foot-wide crown. On both sides of the

notch, it will slope up to an elevation of -8 feet and a 50-foot-wide crown at a 1V:2H slope which will extend 170 feet on both sides of the notch. Boths sides will then slope up to an elevation of +5 feet North American Vertical Datum 1988 (NAVD 88) and a 5-foot-wide crown at a 1V:2H slope to tie into the upstream and downstream riverbank. The foreshore dike extending approximately 675 feet upstream of the sill will be capped with stone to match the tie-in elevation of +5 feet. The structure will slope down to the existing ground from the elevations previously described at a 1V:1.75H slope perpendicular to the riverbank. The inlet of Neptune Pass will be reduced to an area of approximately 7,200 square feet. The structure will be constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds. A 3-foot-thick layer of stone paving scour protection requiring approximately 20,000 tons of 1,200-pound stone will be placed approximately 325 feet into the pass from the crown of the structure. Figure 2 shows the inlet structure.

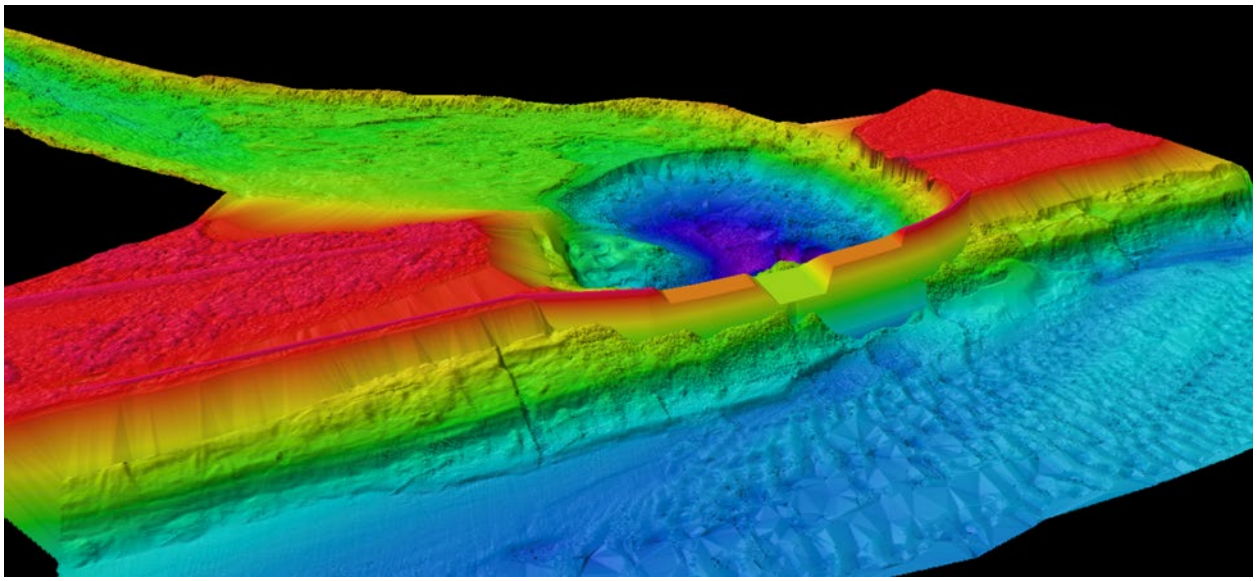

Figure 2. Side scan rendition of Inlet Stone Sill.

Outlet Structures

The Neptune Pass Outlet Structure consists of multiple armored V-shaped sediment retention enhancement devices (SREDs) placed between the -6-foot and -10-foot contours. The SREDs have a 10-foot-wide top and will be constructed to a target elevation of +5.0 feet NAVD88, with side slopes of 1V:2H. Each SRED will consist of multiple terraces that are 300 feet long with 100-foot-long gaps between each terrace. Approximately twenty SREDs will be constructed requiring approximately 400,000 cubic yards of material. The material will be excavated from adjacent borrow, 30 feet offset from the toe of the SRED to a maximum depth of -15.0 feet. To account for any losses, elastic settlement, mud wave action, and localized bearing capacity failures during construction, a cut to fill ratio of 1.5:1 will be used. Approximately 600,000 cubic yards will be excavated from adjacent borrow.

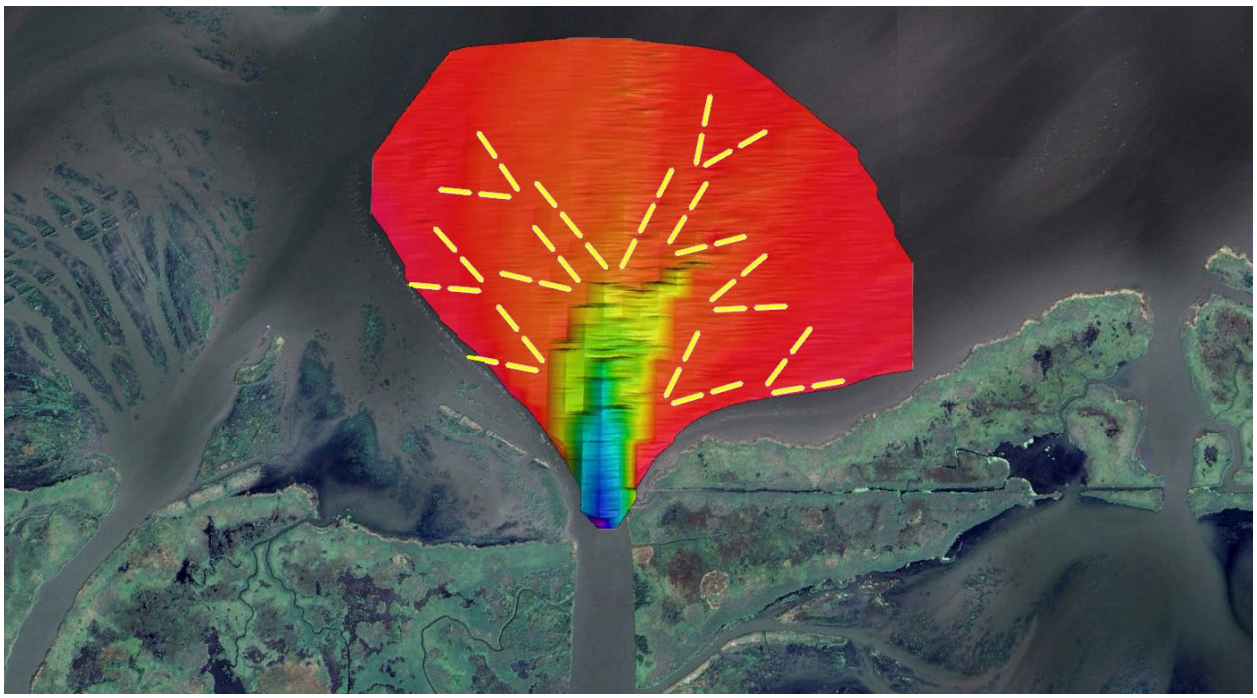

Figure 3. Rendition of approximate location(s) and V-shaped design of Outlet SREDS in Quarantine Bay.

Fish and Wildlife Resources

Breton Sound Basin exhibits an increasing salinity gradient, including freshwater wetlands in the uppermost basin and in the location of existing breaches along the east bank of the Mississippi River, intermediate marsh, followed by brackish habitats, and then saline marshes towards the Gulf of Mexico. Neptune Pass is one of the existing breaches along the east bank of the river located between Mardi Gras Pass and Fort St. Philip. The project area consists of open water with adjacent fresh to intermediate marsh habitat. These wetlands are strongly influenced by freshwater discharges from the Mississippi River and associated distributary outlets.

Wetland Habitats

Based on the August 2022 site visit, the project area freshwater marsh community is consists of cattail (*Typha latifolia*), arrowhead (*Sagittaria latifolia*), bulltongue (*Sagittaria lancifolia*), willow (*Salix nigra*), cut grass (*Leersia hexandra*), and deer pea (*Vigna luteola*). The wetlands of the Breton Sound Basin are enormously high in biological productivity (Day et al. 1982). They serve as vital nursery areas for fish and shellfish (Van Sickle et al. 1976) and wildlife habitat (Lowery 1974). Wetlands provide plant detritus to adjacent coastal waters and thereby contribute to the production of commercially and recreationally important fishes and shellfishes.

Open water habitat of the project area includes the deep water of Neptune Pass and the shallow water at the outlet. Submerged aquatic vegetation (SAV) is interspersed and can include water hyacinth (*Eichhornia crassipes*), alligator weed (*Alternanthera philoxeroides*), coontail (*Ceratophyllum demersum*), wild celery (*Vallisneria Americana*), widgeon grass (*Ruppia maritime*), southern naiad (*Najas guadalupensis*), and Eurasian watermilfoil (*Myriophyllum spicatum*). SAV has been described as “the most significant form of complex cover for aquatic animals” (LDWF 2015) that provide valuable ecosystem services (Chabreck 1972; Hillmann et al. 2018). SAV beds

support aquatic populations and a diverse biota, serve as habitat and nursery grounds for fish and shellfish, export organic matter and nutrients into the water column, oxygenate the water column, and stabilize bottom sediments by reducing current velocity and wave energy.

Fisheries and Essential Fish Habitat

The Breton Basin supports fresh, estuarine, and marine fishes and shellfishes. The project area will be dominated by freshwater fishes include largemouth bass, crappie, bluegill, redear sunfish, red-spotted sunfish, channel catfish, blue catfish, yellow bullhead, freshwater drum, bowfin, carp, buffaloes, and gars. The crustaceans expected to occur in the project area include white shrimp, brown shrimp, and blue crab.

The proposed project is located within an area identified as Essential Fish Habitat (EFH) by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, Magnuson-Stevens Act; P.L. 104-297). The open waters, water-bottom substrates, and inter-tidal marshes of the Neptune Pass Rock Closure project area are considered EFH under the estuarine component. These habitats are used by several federally managed species for foraging and nursery habitat, as well as a migration route to other areas considered to be EFH. The USACE should consult with the NMFS regarding EFH.

Wildlife

The project area provides important habitat for numerous species of wildlife, including waterfowl, wading birds, shorebirds, neotropical migratory birds, mammals, reptiles, and amphibians. Around 283 species of breeding, transient, and nonbreeding species of birds have been recorded in Plaquemines Parish from 2022-2023 (Cornell Lab of Ornithology 2020). The Breton South Basin wetlands support a variety of birds including millions of neotropical migrants and other resident and migratory avian species such as rails, coots, gallinules, shorebirds, wading birds, waterfowl, hawks, owls, and numerous other land birds (including warblers, sparrows, thrushes, vireos, buntings, flycatchers, chickadees, titmouse, wrens, and swallows). Louisiana coastal wetlands provide neotropical migratory birds essential stopover habitat where they can forage and rest, and these coastal habitats provide nesting habitat for hundreds of thousands of birds each year.

Mammals known to occur in the project-area wetlands include manatee, dolphin, mink, raccoon, nutria, river otter, muskrat, nine-banded armadillo, Virginia opossum, cotton mouse, house mouse, hispid cotton rat, eastern cottontail rabbit, swamp rabbit, fox squirrel, grey squirrel, bobcat, and white-tailed deer (Lowery 1974; O'Neil and Linscombe 1975).

Amphibians such as the southern dusky salamander (*Desmognathus fuscus*), dwarf salamander (*Eurycea quadridigitata*), eastern newt (*Notophthalmus viridescens*), three-toed amphiuma (*Amphiuma tridactylum*), lesser siren (*Siren intermedia*), Gulf coast toad (*Incilius nebulifer*), northern cricket frog (*Acris crepitans*), green tree frog (*Hyla cinerea*), squirrel tree frog (*Hyla squirella*), spring peeper (*Pseudacris crucifer*), eastern narrow-mouthed toad (*Gastrophryne carolinensis*), bullfrog(*Lithobates catesbeianus*), green frog (*Lithobates clamitans*), pig frog (*Lithobates grylio*), and southern leopard frog (*Lithobates sphenocephalus*) are expected to occur in freshwater upper basin project-area wetlands (Dundee and Rossman 1989).

Reptiles such as the American alligator (*Alligator mississipppiensis*), diamondback terrapin, eastern mud turtle (*Kinosternon subrubrum*), red-eared slider (*Trachemys scripta*), alligator snapping turtle (*Macroclemys temminckii*), green anole (*Anolis carolinensis*), broadhead skink (*Plestiodon*

laticeps), eastern black kingsnake (*Lampropeltis nigra*), rat snake (*Elaphe obsoleta*), Gulf Coast ribbon snake (*Thamnophis proximus orarius*), cottonmouth (*Agkistrodon piscivorus*), common garter snake (*Thamnophis sirtalis*), and water snakes (*Nerodia* spp.) are expected to occur in the project-area wetlands (Dundee and Rossman 1989). American alligator abundance has been increasing in the upper portions of the basin and declining in the lower portions, but overall has declined as the preferred fresh marsh and intermediate marsh has converted to brackish marsh.

Endangered and Threatened Species

Consistent with our concurrence with the USACE's April 17, 2024 determination letter (Project Code 2024-0078257), the Service maintains our concurrence with the USACE determination that the activities proposed for the Neptune Pass Project are not likely to adversely affect any listed or proposed threatened or endangered species or their critical habitat. No further Endangered Species Act consultation with the Service will be required for the proposed project unless there are changes in the scope or location of the project elements, or the project has not been initiated within one year.

Migratory Bird Treaty Act and Bald and Golden eagle Protection Act

There are several species found throughout the Breton Basin that are protected under the Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.) and/or the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d), including bald eagle, brown pelican and other colonial nesting birds, and most native bird species.

Colonial nesting birds

The proposed Project would be located in an area where colonies of nesting waterbirds may be present. Based on the LDWF's 2022 nesting colony survey data, the Breton South Basin has supported nearly 60 colonies since the early 1980s. Colonies may be present that are not currently listed in the database maintained by the LDWF. Though the waterbird colony database is extensive and updated often, colony nesting site locations are very fluid, particularly, in marsh habitats where late nesters or new colonies can be established between surveys. Due to the difficult nature of documenting all nesting colonies, the Service recommends that a qualified biologist inspect the proposed construction site for the presence of documented and undocumented nesting colonies during the nesting season of each year that project construction is ongoing.

To minimize disturbance to colonial nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills, anhingas, and cormorants), all construction activity occurring within 1,000 feet of a nesting colony should be restricted to the non-nesting period (i.e., September 1 through February 15, exact dates may vary within this window depending on species present). If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the USACE should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies. In addition, during construction activities we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and their nests and how to avoid disturbance of birds and their colonies.

Brown pelicans were delisted (due to recovery) on December 17, 2009, and are no longer protected under the ESA, but they are still protected by the MBTA. Brown pelicans may occasionally feed in the shallow estuarine waters found within the Project Area. Brown pelican colonies are known to nest on Breton Isle in southern Breton Sound.

Bald Eagle
Forested wetlands may provide nesting habitat for the bald eagle, which was officially removed from the List of Endangered and Threatened Species as of August 8, 2007. However, the bald eagle remains protected under the MBTA and BGEPA. Based on LDWF bald eagle nesting survey data, 8 eagle nests have been detected on the east side of the river in Orleans, St. Bernard, and Plaquemines parishes, although no known eagle nest occurs within the project footprint. Because eagles may build new nests each nesting season, we recommend contractors be mindful of nesting eagles during project construction. Bald eagles typically nest in large trees located near coastlines, rivers, or lakes that support adequate foraging from October through mid-May. In southeastern Louisiana parishes, eagles typically nest in mature trees (i.e., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water.

During project construction, on-site personnel should be informed of the possible presence of nesting bald eagles near the project boundary, and should identify, avoid, and immediately report any such nests to this office. If an active or inactive eagle nest is discovered within 2 miles of the project footprint, the applicant should follow the bald and golden eagle guidelines found on-line at https://www.fws.gov/library/collections/bald-and-golden-eagle-management to determine whether disturbance will occur and/or an incidental take permit is needed.

At-Risk Species
The Service's Southeast Region has defined "at-risk species" as those that are: 1) proposed for listing under the ESA by the Service; 2) candidates for listing under the ESA, which means the species has a "warranted but precluded 12-month finding"; or 3) petitioned for listing under the ESA, which means a citizen or group has requested that the Service add them to the list of protected species. Petitioned species include those for which the Service has made a substantial 90-day finding as well as those that are under review for a 90-day finding. As the Service develops proactive conservation strategies with partners for at-risk species, the states' Species of Greatest Conservation Need (defined as species with low or declining populations) will also be considered. See Table 1 for a list of at-risk species; the column with their common name contains a link to additional information on the species. Please utilize the links to find further information on each species and/or contact the Louisiana Ecological Services Office for additional information.

Table 1. At-Risk species that maybe found in the Neptune Pass Project Area.

Species Common Name	**Scientific Name**	**Taxa**
Golden-winged warbler	*Vermivora chrysoptera*	Bird
Coastal (Wayne's) black-throated green warbler	*Setophaga virens waynei*	Bird
Lake Sturgeon	*Acipenser fulvescens*	Fish
American bumble bee	*Bombus pensylvanicus*	Insect
Monarch butterfly	*Danaus plexippus*	Insect
Schoolhouse Springs leuctran stonefly	*Leuctra szczytkoi*	Insect
Southern plains bumble bee	*Bombus fraternus*	Insect
Variable cuckoo bumble bee	*Bombus variabilis*	Insect
Linda's Roadside Skipper	*Amblyscirtes linda*	Insect
Frosted elfin butterfly	*Callophrys irus*	Insect
Little Brown Bat	*Myotis lucifugus*	Mammal

Species Common Name	Scientific Name	Taxa
Tricolored bat	*Perimyotis subflavus*	Mammal
Alabama hickorynut	*Obovaria unicolor*	Mussel
Eastern diamondback rattlesnake	*Crotalus adamanteus*	Reptile
Western chicken turtle	*Deirochelys reticularia miaria*	Reptile
Correll's false dragonhead	*Physostegia correllii*	Plant

Service Concerns

Land Building

Accreting deltaic wetlands, such as those found downstream of Neptune Pass, in Bay Denesse and adjoining marshes, provide valuable high-quality habitat for a variety of fish and wildlife including migratory waterfowl and commercially and recreationally important fish and shellfish. Because of the high rates of subsidence in these lower Mississippi River marshes, a continuous supply of suspended sediment is required to maintain marsh elevations and preclude marsh loss.

In the absence of the proposed action (future without project, FWOP), flow through Neptune Pass would remain unaltered, potentially resulting in the continuation of land building and subsequent vegetative establishment occurring within the bays adjacent to Neptune Pass. The Service recognizes sedimentation occurring within these bays maybe the result of the deposition of scoured material from within Neptune Pass. Based on USACE modeling, this diversion is considered sand lean, diverting a small concentration of sediment from the Mississippi River relative to the amount of water being diverted. It is a perched diversion over a deep part of the river where little sand is being transported. However, the Service also recognizes the difficulty in determining the source of land building material in the adjacent bays whether it be the deposition of scoured material from the eroding of Neptune Pass, as proposed by USACE, or from other sources of suspended sediment transported by the river. For example, land building has been established in other areas of the Mississippi River delta with little to no influence from heavy sediment transport including the bay associated with Ostrica Pass located upriver of Neptune Pass as well as delta splays in the Fort St. Phillips area located downriver of Neptune Pass. Additionally, the bay associated with Caernarvon Pass is exhibiting land building which is located several miles upriver from Neptune Pass. While the Service does not disagree with the USACE's assumption that eroded material from Neptune Pass may have facilitated land building in the adjacent bay, we maintain the difficulty in attributing land building processes to the erosion of Neptune Pass alone as evident by land building in other areas of the river delta that are not necessarily sediment diversions.

Under the future with project (FWP), the cross-sectional area of the pass at the structure site will be reduced by 88 percent, substantially reducing the freshwater influence of the river and the sediment it transports. The Service expects that the splay-nourishing suspended sediment will continue to be maintained through a combination of sediment that flows through the inlet structure while being captured with the outlet structure SREDs. The Service assumes, under FWP, that the deltaic splays built before construction of the Neptune Pass structure will be sustained (no growth and no loss) although the Service recognizes that this assumption may be conservative.

Although the Service assumes no loss of the deltaic splays in the adjacent bays, the Service is concerned that the existing deltaic splays may experience loss not predicted by the project Wetland

Value Assessments (WVAs) and assumptions required to determine project impacts. Consequently, the Service recommends that the project area is monitored annually post-construction to determine if existing splays impacted by the project are experiencing land loss. If monitoring indicates changes from the conditions determined in the project WVAs, then the need for mitigation will have to be assessed.

Salinity

Based on Coastwide Reference Monitoring System (CRMS) hydro station 0139 data, the project area is determined to be a fresh marsh with an average growing season salinity of 0.52 ppt which is located downriver of Neptune Pass (Figure 4). The Service has assumed that river water influence becomes more dominant in FWOP and expects project area salinities to drop which would continue to be favorable for the fresh marsh in the project area. However, under FWP, the cross-sectional area of the pass at the structure site will be reduced by 88 percent, substantially reducing the freshwater influence of the river. Accordingly, the Service assumes that project area salinities will increase throughout the project life. Although the Service assumes that the salinities may increase by 10 percent over the project life, it is possible that salinities in the project area may increase more than expected with greater seasonal influence. With rising sea levels and the reduced river influence in FWP, the Service is concerned about the detrimental effects that increased salinities and saltwater intrusion can have on the fresh marshes of the project area. Saltwater intrusion and increased salinities in the project area can alter plant species composition and extirpate species that require fresher environments (Visser et al. 1999; Neyland 2007). Due to Neyland's (2007) saltwater "burn" effect, plant species may be replaced by more salt tolerant halophytic plants. However, the colonization of halophytic vegetation after the removal of existing vegetation is not guaranteed, especially in high energy environments resulting in the loss of emergent marsh. Therefore, the Service recommends that the project area is monitored annually post-construction to determine if salinities increase beyond expected as well as to determine any changes in marsh types and/or accelerated marsh loss. If monitoring indicates changes from the conditions determined in the project WVAs, then the need for mitigation will have to be assessed.

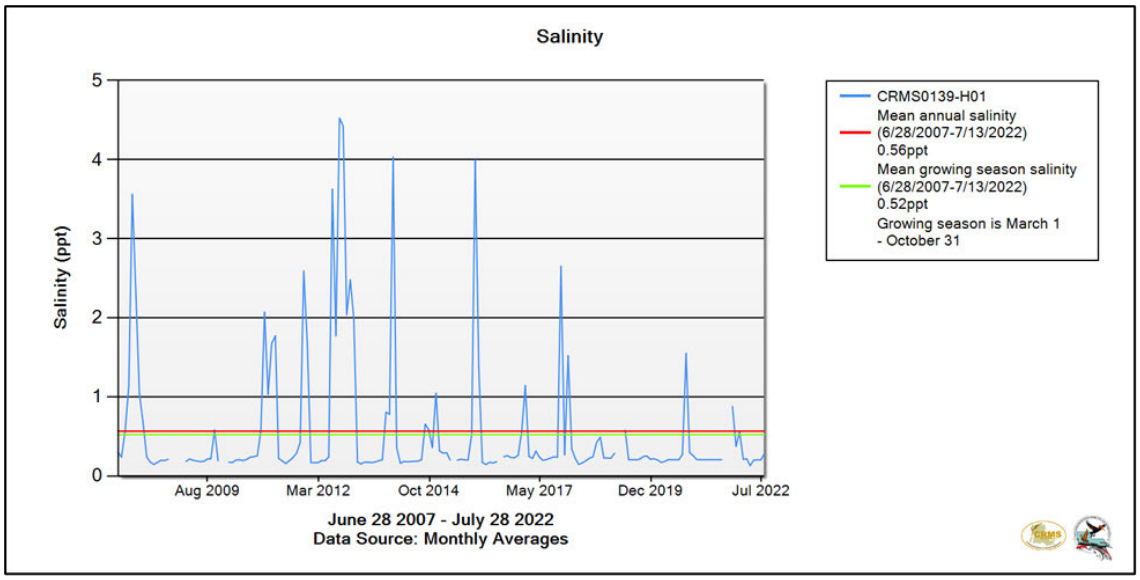

Figure 4. Mean annual and growing season water salinity (ppt) at the CRMS hydro station 0139-H01 located approximately 2.1 miles east (down river) of Neptune Pass.

Service Position and Recommendations

Coastal marshes are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries).

The Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981) identifies four resource categories that are used to ensure that the level of mitigation recommended by Service biologists will be consistent with the fish and wildlife resource values involved. Resource Category 2 are habitats of high value for evaluation species and are relatively scarce or becoming scarce on a national basis or in the ecoregion section. The mitigation goal for habitat in Resource Category 2 is that there should be no net loss of in-kind habitat value.

Project direct or indirect impacts to wetlands should be minimized to the greatest degree possible, and unavoidable impacts should be mitigated in a manner approved by the Service and other natural resource agencies. As proposed, the Neptune Pass Closure inlet and outlet structures would not directly impact wetlands and are assumed to result in no loss of the deltaic splays in the adjacent bays. Additionally, proper care should be taken to ensure that threatened, endangered, and at-risk species, as well as bald eagles and migratory birds will not be adversely affected.

After reviewing the proposed action, its impacts to fish and wildlife resources, and the need to eliminate a navigational hazard in the Mississippi River, the Service does not object to the Neptune Pass Project provided the following recommendations are included in the proposed action:

1. The Service recommends that the project area is monitored annually post-construction to determine if existing delta splays impacted by the project are experiencing land loss. If monitoring indicates changes from the conditions determined in the project WVAs, then the need for mitigation will have to be assessed.
2. The Service recommends that the project area is monitored annually post-construction to determine if salinities increase beyond expected as well as to determine any changes in marsh types and/or accelerated marsh loss. If monitoring indicates changes from the conditions determined in the project WVAs, then the need for mitigation will have to be assessed.
3. West Indian manatees occasionally enter Louisiana coastal waters and streams during the warmer months (i.e., June through September). During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and state law. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with manatees, although passively taking pictures or video would be acceptable. For more detail on avoiding contact with manatees refer to the Endangered and Threatened Species section of this document or contact this office.
4. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of project features and timing of construction. During project construction, a

qualified biologist should inspect the proposed construction site for the presence of documented and undocumented wading bird nesting colonies and bald eagles.

a. All construction activity during the wading bird nesting season (February through October 31 for wading bird nesting colonies, exact dates may vary) should be restricted within 1,000 feet of a wading bird colony. If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the USACE should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies.
b. During construction activities, if a bald eagle nest is within or adjacent to the proposed project foot print, the applicant should follow the bald and golden eagle guidelines found on-line here to determine whether disturbance will occur and/or an incidental take permit is needed.

5. The Service recommends that the USACE contact the Service and the NMFS for additional ESA section 7 consultation if: 1) the scope or location of the proposed Project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat, 3) the action is modified in a manner that causes effects to listed species or designated critical habitat, or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in this consultation should occur before changes are made or finalized.

We appreciate the cooperation of your staff on the Neptune Pass Closure Project. Should your staff have any questions regarding this report, please contact Cathy Breaux (337-291-3122) of this office.

Sincerely

Brigette D. Firmin
Field Supervisor
Louisiana Ecological Service Office

cc: Environmental Protection Agency, Dallas, TX
National Marine Fisheries Service, Baton Rouge, LA
Natural Resources Conservation Service, Alexandria, LA
LA Dept of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD), Baton Rouge, LA
Coastal Protection and Restoration Authority (CPRA), Baton Rouge, LA

Literature Cited

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Louisiana Ecological Services Field Office
200 Dulles Drive
Lafayette, LA 70506
Phone: (337) 291-3100 Fax: (337) 291-3139

In Reply Refer To: 04/17/2024 14:17:09 UTC
Project code: 2024-0078257
Project Name: Mississippi River, Baton Rouge to the Gulf of Mexico, LA, Neptune Pass Rock Closure

Subject: Consistency letter for the project named 'Mississippi River, Baton Rouge to the Gulf of Mexico, LA, Neptune Pass Rock Closure' for specified threatened and endangered species that may occur in your proposed project location pursuant to the Louisiana Endangered Species Act project review and guidance for other federal trust resources determination key (Louisiana DKey).

Dear Mark Lahare:

The U.S. Fish and Wildlife Service (Service) received on April 17, 2024 your effects determination(s) for the 'Mississippi River, Baton Rouge to the Gulf of Mexico, LA, Neptune Pass Rock Closure' (the Action) using the Louisiana DKey within the Information for Planning and Consultation (IPaC) system. The Service developed this system in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based on your answers, and the assistance in the Service's Louisiana DKey, you made the following effect determination(s) for the proposed Action:

Species	Listing Status	Determination
Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)	Threatened	May affect
Pallid Sturgeon (*Scaphirhynchus albus*)	Endangered	May affect
West Indian Manatee (*Trichechus manatus*)	Threatened	NLAA

Consultation with the Service is not complete. Further consultation or coordination with the Louisiana Ecological Services Office is necessary for those species with a determination of "may affect" listed above. Please contact our office at 337-291-3100 or lafayette@fws.gov to discuss methods to avoid or minimize potential adverse effects to those species.

This IPaC-generated letter only applies to the species in the above table and **does not** apply to the following ESA-protected species that also may occur in the Action Area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

Please Note: If the Federal Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) may be required. Please contact Ulgonda Kirkpatrick (phone: 321/972-9089, e-mail: ulgonda_kirkpatrick@fws.gov) with any questions regarding potential impacts to bald or golden eagles.

This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act.) The project, as proposed,

Is not Likely to adversely effect those resources

Deputy Field Supervisor

For Brigette Firmin, Field Supervisor

Supervisor Date

Louisiana Ecological Services Office

U.S. Fish and Wildlife Service

Pallid sturgeon are not know to occur in this area of the river. The habitat in the project area is not suitable for the black rail.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Mississippi River, Baton Rouge to the Gulf of Mexico, LA, Neptune Pass Rock Closure

2. Description

The following description was provided for the project 'Mississippi River, Baton Rouge to the Gulf of Mexico, LA, Neptune Pass Rock Closure':

> The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside the of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of Mexico from continuing to grow. There will be two features that will work together to provide a sustainable solution to remove the hazard. There will be stone placed to raise the existing river bank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There will be Sediment Retention Enhancement Devices built with in situ material at the outlet Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features will be placed in navigable water. The target flow after construction is 80,000 cubic feet per second at a Mississippi River flow of 1 million cubic feet per second.
>
> Inlet Structure
> The stone sill will reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure centerline will be curved to sit on top of the existing bank line sill at the confluence of the Mississippi River and Neptune Pass. The center of the structure will have a 100-foot wide notch at an elevation of -26 feet and a 115-foot wide crown. On both sides of the notch it will slope up to an elevation of -8 feet and a 50-foot wide crown at a 1V:2H slope which will extend 170 feet on both sides of the center notch. Boths sides will then slope up to an elevation of +5 feet and a 5-foot wide crown at a 1V:2H slope to tie into the upstream and downstream Mississippi River bank. The foreshore dike extending approximately 675 feet upstream of the sill will capped with stone to match the tie in elevation of +5 feet. The structure will slope down to the existing ground from the elevations previously described at a 1V:1.75H slope perpendicular to the Mississippi River bank. The inlet of Neptune Pass will be reduced to an area of approximately 7,200 square feet. The structure will be constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds. A 3-foot thick layer of stone paving scour protection

requiring approximately 20,000 tons of 1,200 pound stone will be placed approximately 325 feet into the pass from the crown of the structure.

Outlet Structures
The Neptune Pass Outlet Structure consists of multiple armored V-shaped SREDs placed between
the -6 and -10 foot contour. The SREDs have a five-foot top width and will be constructed to a target
elevation of +5.0 ft. NAVD88, with side slopes of 1V:2H. Each SRED will consist of multiple terraces
that are 300 feet long with 100-foot gaps between each terrace. The SREDs will consist of armor
stone, bedding and core stone, and geotextile. Approximately twenty SREDs will be constructed
requiring approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and
100,000 square yards of geotextile. All work will be via floating plant. Placement of stone will be via
barge mounted excavator or dragline.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@29.35927865,-89.50963341877703,14z

QUALIFICATION INTERVIEW

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Is the action authorized, funded, or being carried out by the:

   a. U.S Army Corps of Engineers

3. Please identify your agency or organization type:

   a. Federal agency

4. Have you determined that the project will have "no effect" on federally listed species? (If unsure select "No")

   No

5. Are you with the U.S. Army Corps of Engineers Regulatory Division?

   No

6. Are you with the U.S. Army Corps of Engineers Planning Division?

   Yes

7. Is the action part of a Civil Works project?

   Yes

8. Does the action result in the discharge of fill into wetlands that meets the *de minis* standard?

   Yes

9. [Hidden Semantic] Does the project intersect the eastern black rail AOI?

   Automatically answered
   Yes

10. Will the proposed project involve human disturbance or ground disturbance (such as foot traffic, vehicles, tracked equipment, excavating, grading, placing fill material, etc.)?

    Yes

11. Does the action consist of either fire management, grazing, haying, mowing and/or other mechanical treatment activities?

    No

12. Will the project result in changes to wetland hydrology (i.e. via new construction or change in existing operation of water control structures, waterbody diversion, major water withdrawals, levee construction, etc.)?

    Yes

13. [Hidden Semantic] Does the project intersect the west indian manatee AOI?

    Automatically answered
    Yes

14. (Semantic) Is the project located within the manatee consultation zone, excluding the Mississippi River?

    Automatically answered
    Yes

15. Is the project footprint entirely on land?

    No

16. Is the water depth within the project greater than 2 feet (at mean high tide)?

    Yes

17. Will the project occur during the months of June through November?

    Yes

18. Will the following Standard Manatee Conditions for in-Water Activities be included as permit conditions?

    Yes

19. [Hidden Semantic] Does the project intersect the pink mucket mussel AOI ?

    Automatically answered
    No

20. [Hidden Semantic] Does the project intersect the pallid sturgeon AOI?

    Automatically answered
    Yes

21. Will the project result in riverine pathway obstruction (such as construction of dams, hydropower plants, etc.)?

    No

22. Will the project include the addition of or modification to water intake structures?

    No

23. Will the project involve modifications to existing or construction of new diversion structure or turbines?

    Yes

24. (Semantic) Does the project intersect the Louisiana black bear Range?

    Automatically answered
    No

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Mark Lahare
Address: 7400 Leake Avenue
City: New Orleans
State: LA
Zip: 70118
Email mark.h.lahare@usace.army.mil
Phone: 5048621344

From:	Lahare, Mark H CIV USARMY CEMVN (USA)
To:	Lahare, Mark H CIV USARMY CEMVN (USA)
Subject:	RE: [Non-DoD Source] Re: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana
Date:	Tuesday, September 3, 2024 7:36:38 AM

Mark Henry Lahare
Coastal Compliance
Environmental Compliance Branch
U.S. Army Corps of Engineers – New Orleans District
(504) 862-1344
<mark.h.lahare@usace.army.mil>

From: Craig Gothreaux - NOAA Federal <craig.gothreaux@noaa.gov>
Sent: Thursday, August 22, 2024 9:53 AM
To: Lahare, Mark H CIV USARMY CEMVN (USA) <Mark.H.Lahare@usace.army.mil>
Cc: _NMFS ser HCDconsultations <nmfs.ser.hcdconsultations@noaa.gov>
Subject: [Non-DoD Source] Re: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana

Mark,

The NMFS Habitat Conservation Division has reviewed draft Environmental Assessment (EA) #589 and the draft Finding of No Significant Impact (FONSI), and does not object to the proposed actions.

Thank you for your coordination,
Craig

On Fri, Aug 2, 2024 at 7:59 AM Rusty Swafford - NOAA Federal <rusty.swafford@noaa.gov> wrote:

> ---------- Forwarded message ---------
> From: **Lahare, Mark H CIV USARMY CEMVN (USA)** <Mark.H.Lahare@usace.army.mil>
> Date: Fri, Aug 2, 2024 at 7:33 AM
> Subject: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana
> To: Swafford, Rusty <rusty.swafford@noaa.gov>
>
> Dear Mr. Swafford:

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South, has prepared the attached draft Environmental Assessment (EA) #589 to evaluate the potential impacts associated with constructing flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana. In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed further in this revised draft EA.

Please reference the letter addressed to your office attached to this e-mail for additional project and contact information.

Public comments for the draft EA and FONSI will be accepted through **August 31, 2024**.

Respectfully,

-Mark Lahare

_____

Mark Henry Lahare

Coastal Compliance

U.S. Army Corps of Engineers - New Orleans District

(504) 862-1344

<mark.h.lahare@usace.army.mil>

--

Rusty Swafford
Gulf of Mexico Branch Chief
Southeast Region, Habitat Conservation Division
NOAA Fisheries
U.S. Department of Commerce
4700 Av U, Galveston, TX 77551
Office: (409) 766-3699

FAX: (409) 766-3575
Rusty.Swafford@noaa.gov

--

Craig Gothreaux
Fishery Biologist
Southeast Region, Habitat Conservation Division
NOAA Fisheries
5757 Corporate Blvd., Suite 375
Baton Rouge, LA 70808
Office: (601) 890-1275
Craig.Gothreaux@noaa.gov

Web	*www.nmfs.noaa.gov*
Facebook	*www.facebook.com/usnoaafisheriesgov*
Twitter	*www.twitter.com/noaafisheries*
YouTube	*www.youtube.com/usnoaafisheriesgov*

LOUISIANA DEPARTMENT OF AGRICULTURE & FORESTRY
MIKE STRAIN DVM
COMMISSIONER

Agricultural & Environmental Sciences
P.O. Box 3596
Baton Rouge,
LA 70821
(225) 925-3770
Fax: 925-3760

Agro-Consumer Services
P.O. Box 3098
Baton Rouge,
LA 70821
(225) 922-1341
Fax: 923-4877

Animal Health & Food Safety
P.O. Box 1951
Baton Rouge,
LA 70821
(225) 925-3962
Fax: 925-4103

Forestry
P.O. Box 1628
Baton Rouge,
LA 70821
(225) 925-4500
Fax: 922-1356

Management & Finance
P.O. Box 3481
Baton Rouge,
LA 70821
(225) 922-1255
Fax: 925-6012

Soil & Water Conservation
P.O. Box 3554
Baton Rouge,
LA 70821
(225) 922-1269
Fax: 922-2577

August 13, 2024

Mark Lahare, USACE
New Orleans District
7400 Leake Avenue
New Orleans, Louisiana 70118
(504) 862-1344
mark.h.lahare@usace.army.mil

Ref: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana

Dear Mr. Lahare,

The LDAF/Office of Soil & Water Conservation has reviewed the attached Environmental Assessment (EA) #589 regarding the proposed flow control structures in Neptune Pass and in Quarantine Bay on the left descending bank of the Mississippi River, in Plaquemines Parish, LA, approximately 11 miles northwest of Venice, LA and has no objection.

If this office may be of any assistance, please do not hesitate to contact us.

Sincerely,

Joey Breaux
Assistant Commissioner,
LDAF/Office of Soil & Water Conservation
225.922.1269

JEFF LANDRY
GOVERNOR

AURELIA S. GIACOMETTO
SECRETARY

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

August 28, 2024

Chief Mark R. Smith, Environmental Compliance Branch
U.S. Army Corps of Engineers, New Orleans District
7400 Leake Avenue
New Orleans, LA 70118
mark.h.lahare@usace.army.mil

RE: 240809/0925

Draft EA #589 and associated FONSI for Neptune Pass Rock Closure
US Army Corps of Engineers Funding
Plaquemines Parish

Dear Chief Smith:

The Louisiana Department of Environmental Quality (LDEQ) has received your request for comments on the above referenced project.

After reviewing your request, the Department has no objections based on the information provided in your submittal. However, for your information, the following general comments have been included. Please be advised that if you should encounter a problem during the implementation of this project, you should immediately notify LDEQ's Single-Point-of-contact (SPOC) at (225) 219-3640.

- Please take any necessary steps to obtain and/or update all necessary approvals and environmental permits regarding this proposed project.
- If your project results in a discharge to waters of the state, submittal of a Louisiana Pollutant Discharge Elimination System (LPDES) application may be necessary.
- If the project results in a discharge of wastewater to an existing wastewater treatment system, that wastewater treatment system may need to modify its LPDES permit before accepting the additional wastewater.
- All precautions should be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one acre. It is recommended that you contact Debbie Bissett (Debbie.Bissett@la.gov) or Melissa Reboul (Melissa.Reboul@la.gov) with the LDEQ Water Permits Division at (225) 219-3590 to determine if your proposed project requires a permit.
- If your project will include a sanitary wastewater treatment facility, a Sewage Sludge and Biosolids Use or Disposal Permit is required. An application form or Notice of Intent will need to be submitted if the sludge management practice includes preparing biosolids for land application or preparing sewage sludge to be hauled to a landfill. Additional information may be obtained on the LDEQ website at https://deq.louisiana.gov/page/sewage-biosolids or by contacting Ronda Burtch with the LDEQ Water Permits Division at (225) 219- 3213 or Ronda.Burtch@la.gov.

STATE OF LOUISIANA

DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

- If any of the proposed work is located in wetlands or other areas subject to the jurisdiction of the U.S. Army Corps of Engineers, you should contact the Corps directly regarding permitting issues. If a Corps permit is required, part of the application process may involve a water quality certification from LDEQ.
- All precautions should be observed to protect the groundwater of the region.
- Please be advised that water softeners generate wastewaters that may require special limitations depending on local water quality considerations. Therefore if your water system improvements include water softeners, you are advised to contact the LDEQ Water Permits to determine if special water quality-based limitations will be necessary.
- Any renovation or remodeling must comply with LAC 33:III.Chapter 28, Lead-Based Paint Activities; LAC 33:III.Chapter 27, Asbestos-Containing Materials in Schools and State Buildings (includes all training and accreditation); and LAC 33:III.5151, Emission Standard for Asbestos for any renovations or demolitions.
- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 or SPOC@la.gov is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.
- **If any underground storage tanks are encountered during the project, they must be in compliance with the regulations found in LAC 33:XI of the Environmental Regulatory Code. If any contaminated soil or groundwater is encountered, the findings should be reported to LDEQ.**

Currently, Plaquemines Parish is classified as attainment with the National Ambient Air Quality Standards and has no general conformity determination obligations.

Please send all Solicitation of Views (SOVs) requests and questions to SOVs@la.gov.
For Air Planning & Assessment questions/inquiries, please contact John Babin at 225-219-1801 or John.Babin@la.gov.
For Water Planning & Assessment question/inquiries, please contact Kori Blitch at 225-219-3499 or Kori.Blitch@la.gov.
For Remediation question/inquiries, please contact Keith Horn at 225-219-3717 or Keith.Horn@la.gov.
For Underground Storage Tank questions/inquiries, please contact Chris Means at 225-219-3652 or Chris.Means@la.gov.

Sincerely,

mcjimenez

Marissa Jimenez
Environmental Scientist Manager
Louisiana Department of Environmental Quality
Office of the Secretary

DEPARTMENT OF THE
CORPS OF ENGINEERS, NEW ORLI
7400 LEAKE AVE
NEW ORLEANS LA 70118

No known historic properties will be affected by this undertaking. Therefore, our office has no objection to the implementation of this project. This effect determination could change should new information come to our attention.

Kristin P. Sanders

Kristin P. Sanders
State Historic Preservation Officer
Date 6/28/2022

June 13, 2022

Regional Planning and
Environment Division, South
Environmental Planning Branch
Attn: CEMVN-PDS-N

Kristin Sanders, SHPO
LA State Historic Preservation Officer
P.O. Box 44247
Baton Rouge, LA 70804-4241

RE: Section 106 Review Consultation
Undertaking: Closure of a Mississippi River breach at Neptune Pass, Mile 24-L, Plaquemines Parish, Louisiana (Latitude 29.365; Longitude -89.510)
Determination: **No Historic Properties Affected**

Dear Ms. Sanders:

The U.S. Army Corps of Engineers (USACE), New Orleans District, proposes to repair a breach of the east bank of the Mississippi River upriver of Fort St. Philip and Plaquemine Bend. This breach has been known and monitored for recent years. The Neptune Pass channel was a consistent width and depth during recent historic times, but between 2019 and now it has widened substantially and has created a deep scour. Together, these factors act to increase the capture of flow from the Mississippi River. If this capture continues, Navigation in the lower portion from the Mississippi River into the Gulf of Mexico is severely threatened by the loss of velocity that would drop sediment load and require frequent dredging. Riverbank and channel scour will continue unless the flow though this channel is reduced.

As part of CEMVN's evaluation and in partial fulfillment of responsibilities under the National Environmental Policy Act and Section 106 of the National Historic Preservation Act, CEMVN offers you the opportunity to review and comment on the potential of the proposed action described in this letter to affect historic properties. Additionally, in accordance with the of responsibilities of Executive Order 13175, CEMVN offers Federally-recognized Tribes the opportunity to review and comment on the potential of the proposed undertaking described in this letter to significantly affect protected tribal resources, tribal rights, or tribal lands.

Description of the Undertaking

Three distinct but related measures are proposed. A Stone Closure Structure would be constructed by barging stone into Neptune Pass. The Closure would have a width of 6 foot on the crown at an elevation of +5 feet NAVD88. A bank paving would also be placed on the south side of the closure structure, and both bank paving and channel paving would be placed on the north side of the closure. Lastly, the closure structure would need to be keyed-in to the natural and remaining sides of the crevasse. The second and third measures proposed are to prevent flanking or further scour underneath of the closure structure by crevasse waters (Enclosures 1-4).

Area of Potential Effects (APE)

The APE is defined to be the area represented by the 3D Visualization of the closure structure and by the Draft Plan of construction. As currently designed, this may include approximately 1600 feet length across the crevasse including the key-in to existing bank, and as much as 600 feet breadth within the crevasse itself. The key-in to remaining land, is currently proposed to measure approximately 500 feet long and 120 feet wide, on both sides of the crevasse. There will also be access area necessary around the periphery of the closure, while construction is ongoing. The total APE for direct and indirect effects is 10.28 acres in size (Enclosure 4_Proposed Entry Limits).

Known resources and past investigations within each of the identified APE's are described below in the "Identification and Evaluation" portion of this letter.

Identification and Evaluation

Background and literature review has been conducted by USACE staff. Historic properties in the project vicinity were identified based on a review of the NRHP database, the Louisiana Cultural Resources Map, historic map research, and a review of cultural resources survey reports. Additionally, available Multibeam Sonar data, that creates a picture of the bankline under water, has been reviewed (images from the sonar data are in Enclosure 2).

There have been no Phase I cultural resources surveys within the proposed footprint of the closure structure, and no cultural resources have been recorded. However, Phase I survey conducted by Lackowicz et al. (2012) and especially the discussion of paleogeography, enlighten understanding of the APE. These lands are part of the Balize Delta Complex and estimated to be no older than 600 years B.P. The route of the river has continued to evolve even since that time, with the Plaquemine Bend undergoing documented movement since the Civil War (Lackowicz et al. 2012:6). Man-made levees that have existed in this portion of the east bank Mississippi River are not maintained, and, as such, the natural river actions have been largely unbroken. A natural cycle of flooding, deposition, erosion, and channel movement has continuously occurred. Likewise, maps show numerous straight artificial canals slicing through the available land, due either to early irrigation efforts or oil exploration or some similar efforts. Soils surrounding the proposed closure structure are classified as Gentilly muck and frequently flooded.

Review of historic maps and aerial photography, is not in itself conclusive. There is variability in the depiction of the riverbank across the years, but digital overlay of visible landmarks such as the bend in the Crevassli Canal (Mississippi River Commission 1871, sheet 82), and various other canals, historic levees, and eventually even the location of roads, provides great certainty that any historic activity has been on the firmer ground much closer to the river than the current APE, and that the growth of the crevasse itself has probably destroyed any of these historic remains. These maps strongly suggest that the current APE was historically swamp grass and marsh. Likewise, the geologically-young age of the land, the crevasse, the canals, and the previous natural flooding and deposition of the river, makes the preservation of intact prehistoric remains a very low probability. Given these data, it is unlikely that any historic properties are within the APE.

Assessment of Effects

Based on the information presented in this letter, CEMVN has determined that there are no historic properties, as defined in 36 CFR 800.16 (l) in the APE. As such, the USACE has made a determination of **no historic properties affected** as a result of this undertaking. This project will be subject to the standard change in scope of work, unexpected discovery, and unmarked human burial sites act provisions. USACE requests your comments within 30 days.

Moreover, the crevasse will continue to grow until action is taken, and three years of satellite imagery show it growing at a rapid rate. Although no Phase I survey has been conducted, the review of historic evidence and imagery suggest the APE as a low probability area for intact resources. The available evidence suggests that greater harm comes to any potential historic property by failing to take actions to prevent growth of the crevasse.

We look forward to your concurrence with this determination. Should you have any questions or need additional information with this undertaking, please contact Dr. Paul Hughbanks, Archaeologist; U.S. Army Corps of Engineers, New Orleans District at paul.j.hughbanks@usace.army.mil; or Jason Emery, Archaeologist and Tribal Liaison at (504) 862-2364 jason.e.emery@usace.army.mil.

Sincerely,

ERIC M. WILLIAMS
Chief, Environmental Planning Branch

CC:File

An electronic copy of this letter with enclosures will be provided to the Section 106 Inbox, section106@crt.la.gov.

Sources Cited

Lackowicz, Robert, J.B. Pelletier, Katy Coyle, and Meredith Marten
2012 *Phase I Terrestrial Cultural Resources Survey and Marine Archeological Remote Sensing of the Proposed Delta Building Diversion Project, Fort St. Philip, Plaquemines Parish, Louisiana*. (State Report 22-3550)

Mississippi River Commission
2012 *Survey of the Mississippi River, Chart No. 82.*

DEPARTMENT OF
CORPS OF ENGINEERS, NEW
7400 LEAKE A
NEW ORLEANS LA 7

Our records and oral traditions do not indicate that a specific Chitimacha archaeological site or Traditional Cultural Property is within the APE and could be affected; therefore we have no objection to the implementation of the proposed activity; however, if human remains or cultural resources are discovered, you should stop immediately and contact me and the Louisiana State Historic Preservation Office.

Kimberly S. Walden, THPO — Date 7/15/22

June 13, 2022

Regional Planning and
Environment Division, South
Environmental Planning Branch
Attn: CEMVN-PDS-N

Melissa Darden, Chairman
Chitimacha Tribe of Louisiana
P.O. Box 661
Charenton, LA 70523

RE: Section 106 Review Consultation
Undertaking: Closure of a Mississippi River breach at Neptune Pass, Mile 24-L, Plaquemines Parish, Louisiana (Latitude 29.365; Longitude -89.510)
Determination: **No Historic Properties Affected**

Dear Chairman Darden:

The U.S. Army Corps of Engineers (USACE), New Orleans District, proposes to repair a breach of the east bank of the Mississippi River upriver of Fort St. Philip and Plaquemine Bend. This breach has been known and monitored for recent years. The Neptune Pass channel was a consistent width and depth during recent historic times, but between 2019 and now it has widened substantially and has created a deep scour. Together, these factors act to increase the capture of flow from the Mississippi River. If this capture continues, Navigation in the lower portion from the Mississippi River into the Gulf of Mexico is severely threatened by the loss of velocity that would drop sediment load and require frequent dredging. Riverbank and channel scour will continue unless the flow though this channel is reduced.

As part of CEMVN's evaluation and in partial fulfillment of responsibilities under the National Environmental Policy Act and Section 106 of the National Historic Preservation Act, CEMVN offers you the opportunity to review and comment on the potential of the proposed action described in this letter to affect historic properties. Additionally, in accordance with the of responsibilities of Executive Order 13175, CEMVN offers Federally-recognized Tribes the opportunity to review and comment on the potential of the proposed undertaking described in this letter to significantly affect protected tribal resources, tribal rights, or tribal lands.

From:	Lindsey Bilyeu
To:	Hughbanks, Paul J CIV USARMY CEMVN (USA)
Subject:	[Non-DoD Source] RE: USACE Section 106: Finding of No Historic Properties Affected for Breach Closure of Neptune Pass, Plaquemines Parish
Date:	Monday, July 11, 2022 4:45:37 PM

Paul,

The Choctaw Nation of Oklahoma thanks the USACE, New Orleans District, for the correspondence regarding the above referenced project. Plaquemines Parish lies in our area of historic interest. The Choctaw Nation Historic Preservation Department has reviewed the documents provided and we concur with the finding of "no historic properties affected". However, we ask that work be stopped, and our office contacted immediately, in the event that Native American artifacts or human remains are encountered.

If you have any questions, please contact me.

Thank you,

Lindsey D. Bilyeu, M.S.
Program Coordinator 2
Choctaw Nation of Oklahoma
Historic Preservation Department
[redacted]

From: Hughbanks, Paul J CIV USARMY CEMVN (USA) <Paul.J.Hughbanks@usace.army.mil>
Sent: Friday, June 10, 2022 3:20 PM
To: Ian Thompson <ithompson@choctawnation.com>; Lindsey Bilyeu <lbilyeu@choctawnation.com>
Cc: Emery, Jason A CIV USARMY CEMVN (USA) <Jason.A.Emery@usace.army.mil>
Subject: [WARNING: UNSCANNABLE EXTRACTION FAILED]USACE Section 106: Finding of No Historic Properties Affected for Breach Closure of Neptune Pass, Plaquemines Parish

Hello:

Attached, please find a signed Finding of No Historic Properties Affected for the emergency closure of a breach at Neptune Pass, Mississippi River, Plaquemines Parish, Louisiana.

Please notify the Archaeologist or District Tribal Liaison with questions or comments. Their contact information follows: Dr. Paul Hughbanks, (504) 862-1100 or Paul.J.Hughbanks@usace.army.mil; Jason A. Emery, MVN Archaeologist and District Tribal Liaison at (504) 862-2364 or jason.a.emery@usace.army.mil.

Sincerely,
Paul Hughbanks
Archaeologist, Natural/Cultural Resources Analysis RPEDS, New Orleans District

Office: 504-862-1100

From: Turner Hunt
To: Hughbanks, Paul J CIV USARMY CEMVN (USA); Section106
Cc: Emery, Jason A CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] RE: USACE Section 106: Finding of No Historic Properties Affected for Breach Closure of Neptune Pass, Plaquemines Parish
Date: Thursday, July 7, 2022 9:51:25 AM
Attachments: image001.png

Mr. Hughbanks,

Thank you for your recent correspondence regarding the Breach Closure of Neptune Pass. This project is occurring outside of the Muscogee (Creek) Nation's historic area of interest and we will respectfully defer to other federally recognized Tribes you may have contacted. Please let me know if you have any questions. Thank you for your time. Mvto!

Turner W. Hunt
Tribal Historic Preservation Officer
Historic and Cultural Preservation Department
The Muscogee Nation
[redacted]
MuscogeeNation.com
[redacted]

7E8473C8

From: Hughbanks, Paul J CIV USARMY CEMVN (USA) <Paul.J.Hughbanks@usace.army.mil>
Sent: Friday, June 10, 2022 3:18 PM
To: Section106 <section106@muscogeenation.com>; Turner Hunt <thunt@muscogeenation.com>
Cc: Emery, Jason A CIV USARMY CEMVN (USA) <Jason.A.Emery@usace.army.mil>
Subject: [WARNING: UNSCANNABLE EXTRACTION FAILED]USACE Section 106: Finding of No Historic Properties Affected for Breach Closure of Neptune Pass, Plaquemines Parish

Hello:

Attached, please find a signed Finding of No Historic Properties Affected for the emergency closure of a breach at Neptune Pass, Mississippi River, Plaquemines Parish, Louisiana.

Please notify the Archaeologist or District Tribal Liaison with questions or comments. Their contact information follows: Dr. Paul Hughbanks, (504) 862-1100 or Paul.J.Hughbanks@usace.army.mil; Jason A. Emery, MVN Archaeologist and District Tribal Liaison at (504) 862-2364 or jason.a.emery@usace.army.mil.

Sincerely,
Paul Hughbanks
Archaeologist, Natural/Cultural Resources Analysis RPEDS, New Orleans District
Office: 504-862-1100

Appendix B

Public Comments and Responses

LOUISIANA DEPARTMENT OF AGRICULTURE & FORESTRY
MIKE STRAIN DVM
COMMISSIONER

Agricultural & Environmental Sciences
P.O. Box 3596
Baton Rouge,
LA 70821
(225) 925-3770
Fax: 925-3760

Agro-Consumer Services
P.O. Box 3098
Baton Rouge,
LA 70821
(225) 922-1341
Fax: 923-4877

Animal Health & Food Safety
P.O. Box 1951
Baton Rouge,
LA 70821
(225) 925-3962
Fax: 925-4103

Forestry
P.O. Box 1628
Baton Rouge,
LA 70821
(225) 925-4500
Fax: 922-1356

Management & Finance
P.O. Box 3481
Baton Rouge,
LA 70821
(225) 922-1255
Fax: 925-6012

Soil & Water Conservation
P.O. Box 3554
Baton Rouge,
LA 70821
(225) 922-1269
Fax: 922-2577

August 13, 2024

Mark Lahare, USACE
New Orleans District
7400 Leake Avenue
New Orleans, Louisiana 70118
(504) 862-1344
mark.h.lahare@usace.army.mil

Ref: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana

Dear Mr. Lahare,

The LDAF/Office of Soil & Water Conservation has reviewed the attached Environmental Assessment (EA) #589 regarding the proposed flow control structures in Neptune Pass and in Quarantine Bay on the left descending bank of the Mississippi River, in Plaquemines Parish, LA, approximately 11 miles northwest of Venice, LA and has no objection.

If this office may be of any assistance, please do not hesitate to contact us.

Sincerely,

Joey Breaux
Assistant Commissioner,
LDAF/Office of Soil & Water Conservation
225.922.1269

August 16, 2024

To: Mr. Mark Lahare
United States Army Corps of Engineers
Regional Planning and Environment Division South
New Orleans Environmental Branch
7400 Leake Avenue
New Orleans, Louisiana 70118-3651

Re: NEPA-EA #589 Additional Document Request and Comment Extension Request

Mr. Lahare,

I am writing on behalf of the Coalition to Restore Coastal Louisiana (CRCL), the first statewide nonprofit organization dedicated to confronting coastal land loss. We represent a unique mix of businesses, local governments, industries, scientific communities, national and local conservation groups, hunters, anglers and a broad spectrum of concerned residents. Our mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL is encouraged to see the corps taking a broader assessment of the ecological benefits produced by Neptune Pass in Environmental Assessment #589 (EA #589) released on August 2, 2024. While we remain optimistic about the corps plans to leave the pass partially open, CRCL would like to formally request the following additional documents and information mentioned by the EA #589 for further assessment:

1. All USACE modeling reports related to the proposed action for Neptune Pass, including but not limited to the 2023 draft model report mentioned in the references.
2. Any cost estimates for the Sediment Retention Enhancement Devices (SREDs) mentioned in EA #589.
3. Information relating to the bidding process for the river-facing structure and the SREDs, including information about whether these projects will be treated as two separate projects or one.
4. Any information relating to the current designs and design stages of the SREDs.

In addition to the list above, CRCL is formally requesting an extension to the public comment period. We believe that the information we are requesting will be vital to the full understanding of the proposed changes. Until we have an opportunity to assess this information, CRCL cannot fully form positions for our organization and the stakeholders we represent.

I appreciate the opportunity to request additional information and the public comment extension. If you have any questions, please feel free to email me at ethan.melancon@crcl.org.

Thank you,

Ethan J. Melancon

Advocacy Director

The Coalition to Restore Coastal Louisiana

JEFF LANDRY
GOVERNOR

AURELIA S. GIACOMETTO
SECRETARY

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

August 28, 2024

Chief Mark R. Smith, Environmental Compliance Branch
U.S. Army Corps of Engineers, New Orleans District
7400 Leake Avenue
New Orleans, LA 70118
mark.h.lahare@usace.army.mil

RE: 240809/0925

Draft EA #589 and associated FONSI for Neptune Pass Rock Closure
US Army Corps of Engineers Funding
Plaquemines Parish

Dear Chief Smith:

The Louisiana Department of Environmental Quality (LDEQ) has received your request for comments on the above referenced project.

After reviewing your request, the Department has no objections based on the information provided in your submittal. However, for your information, the following general comments have been included. Please be advised that if you should encounter a problem during the implementation of this project, you should immediately notify LDEQ's Single-Point-of-contact (SPOC) at (225) 219-3640.

- Please take any necessary steps to obtain and/or update all necessary approvals and environmental permits regarding this proposed project.
- If your project results in a discharge to waters of the state, submittal of a Louisiana Pollutant Discharge Elimination System (LPDES) application may be necessary.
- If the project results in a discharge of wastewater to an existing wastewater treatment system, that wastewater treatment system may need to modify its LPDES permit before accepting the additional wastewater.
- All precautions should be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one acre. It is recommended that you contact Debbie Bissett (Debbie.Bissett@la.gov) or Melissa Reboul (Melissa.Reboul@la.gov) with the LDEQ Water Permits Division at (225) 219-3590 to determine if your proposed project requires a permit.
- If your project will include a sanitary wastewater treatment facility, a Sewage Sludge and Biosolids Use or Disposal Permit is required. An application form or Notice of Intent will need to be submitted if the sludge management practice includes preparing biosolids for land application or preparing sewage sludge to be hauled to a landfill. Additional information may be obtained on the LDEQ website at https://deq.louisiana.gov/page/sewage-biosolids or by contacting Ronda Burtch with the LDEQ Water Permits Division at (225) 219- 3213 or Ronda.Burtch@la.gov.

STATE OF LOUISIANA

DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

- If any of the proposed work is located in wetlands or other areas subject to the jurisdiction of the U.S. Army Corps of Engineers, you should contact the Corps directly regarding permitting issues. If a Corps permit is required, part of the application process may involve a water quality certification from LDEQ.
- All precautions should be observed to protect the groundwater of the region.
- Please be advised that water softeners generate wastewaters that may require special limitations depending on local water quality considerations. Therefore if your water system improvements include water softeners, you are advised to contact the LDEQ Water Permits to determine if special water quality-based limitations will be necessary.
- Any renovation or remodeling must comply with LAC 33:III.Chapter 28, Lead-Based Paint Activities; LAC 33:III.Chapter 27, Asbestos-Containing Materials in Schools and State Buildings (includes all training and accreditation); and LAC 33:III.5151, Emission Standard for Asbestos for any renovations or demolitions.
- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 or SPOC@la.gov is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.
- **If any underground storage tanks are encountered during the project, they must be in compliance with the regulations found in LAC 33:XI of the Environmental Regulatory Code. If any contaminated soil or groundwater is encountered, the findings should be reported to LDEQ.**

Currently, Plaquemines Parish is classified as attainment with the National Ambient Air Quality Standards and has no general conformity determination obligations.

Please send all Solicitation of Views (SOVs) requests and questions to SOVs@la.gov.
For Air Planning & Assessment questions/inquiries, please contact John Babin at 225-219-1801 or John.Babin@la.gov.
For Water Planning & Assessment question/inquiries, please contact Kori Blitch at 225-219-3499 or Kori.Blitch@la.gov.
For Remediation question/inquiries, please contact Keith Horn at 225-219-3717 or Keith.Horn@la.gov.
For Underground Storage Tank questions/inquiries, please contact Chris Means at 225-219-3652 or Chris.Means@la.gov.

Sincerely,

mcjimenez

Marissa Jimenez
Environmental Scientist Manager
Louisiana Department of Environmental Quality
Office of the Secretary

From: John Morello
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] comments on Neptune Pass
Date: Thursday, August 29, 2024 2:43:00 PM

Hello Mr. Lahare,

I am writing to you as a member of the Coastal Advisory Council at the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL has been very engaged with the corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

I would like to see Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new EA and plan to install a sill and sediment retention devices. I am grateful that the corps is considering both navigation on the river and the ecosystem adjacent to it.

While the plan is a marked improvement over the previous proposal that would have largely sealed off the pass, I am asking that the corps consider how it can be improved further. For instance, can the notch in the sill be at a lower depth to allow more sediment to enter the pass? Can the SREDs be designed to better reflect the corps mandate to enact nature-based solutions? And can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf?

I congratulate the corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments. Please feel free to contact me with any questions.

John Morello
john@morello.net
[redacted]

From: Sarah Giles
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass EA public comments
Date: Thursday, August 29, 2024 3:49:18 PM

Dear Mr. Lahare,

I am writing to you as a wetland biologist, fly fishing guide, and member of the board of directors of the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL has been very engaged with the corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

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Thank you,

Sarah Giles

From: Kristian Sonnier
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass
Date: Thursday, August 29, 2024 3:04:55 PM

Dear Mr. Lahare,

I am writing to you as a member of the board of directors of the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL has been very engaged with the corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

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I congratulate the corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments.

I have been to Neptune Pass a few times and am amazed at its capacity to build land for free (vs.~$3 billion to build a diversion in Myrtle Grove). If we can allow the river to build land and provide safe navigation of the river, let us try. RIght?

Thank you!

Kristian

From: Tina Freeman
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass
Date: Thursday, August 29, 2024 3:19:30 PM

Dear Mr. Lahare,

I am writing to you as a member of the Coastal Advisory Council at the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

I have visited Neptune Pass and I was very excited to see the river being able to build wetlands. I do hope this can continue by deepen a notch to allow more building.

CRCL has been very engaged with the corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

I would like to see Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new EA and plan to install a sill and sediment retention devices. I am grateful that the corps is considering both navigation on the river and the ecosystem adjacent to it.

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I congratulate the corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments.

Tina Freeman
New Orleans, LA

From:	John D. Ross Jr.
To:	Lahare, Mark H CIV USARMY CEMVN (USA)
Subject:	[Non-DoD Source] Concerned Louisiana Citizen Who Supports All Restoration Efforts
Date:	Friday, August 30, 2024 10:21:38 AM

Good morning Mr. Lahare,

I am writing to you as an executive member of the board of directors of the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all. **I moved back to Louisiana to build a new energy company that's hired more than 150 employees locally and dedicate my time to restoring the Louisiana coast.**

CRCL has been very engaged with the corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

I would like to see Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new EA and plan to install a sill and sediment retention devices. I am grateful that the corps is considering both navigation on the river and the ecosystem adjacent to it.

While the plan is a marked improvement over the previous proposal that would have largely sealed off the pass, **I am asking that the corps consider how it can be improved further. For instance, can the notch in the sill be at a lower depth to allow more sediment to enter the pass?** Can the SREDs be designed to better reflect the corps mandate to enact nature-based solutions? And can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf?

I congratulate the corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments. Anything we can do to help the mission to restore the coast, count me in!

John Ross

--
John D. Ross, Jr.
[redacted]

From: Stephen Chustz
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass Public Comment
Date: Friday, August 30, 2024 10:39:51 AM

Dear Mr. Lahare,

I am writing to you as a member of the board of directors of the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL has been very engaged with the corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story. We certainly appreciate the Corps willingness to engage with us and considering our comments that we believe will be beneficial to coastal restoration and hurricane protection and provide for safe navigation.

I would like to see Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new EA and plan to install a sill and sediment retention devices. I am grateful that the corps is considering both navigation on the river and the ecosystem adjacent to it.

While the plan is a marked improvement over the previous proposal that would have largely sealed off the pass, I am asking that the corps consider how it can be improved further. Specifically, looking for innovative ways to allow more sediment to be distributed through the pass while still providing safe navigation. Utilization of sediment dredged both up and downriver from the pass to deposit into the pass so that it can be funneled into Quarantine Bay would not impact navigation and would be beneficial to landbuilding that is occuring.

I congratulate the corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments.

Sincerely,

Steve Chustz

CRCL Board Member

From: Albertine Kimble
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass comment
Date: Friday, August 30, 2024 5:56:13 PM

Dear Mr. Lahare,

My name is Albertine M. Kimble I reside at 10653 Hwy 39 Carlisle Louisiana 70040. I have been a Plaquemines Parish east bank resident all my life. I have concerns about Neptune Pass which was formed during the 2019 high Mississippi river event. Since the opening of the pass, much needed nutrients and sediment have been depositing into the Quarantine Bay and Bay Denesse creating instant wetlands that protect the Breton Sound estuary. Part of the state's master plan includes diverting Mississippi river water into the starving estuary to protect and restore existing wetlands. I believe that the COE and the navigation industry can work together to maintain the opening of Neptune Pass to allow enough river water to sustain what has been created and can still create more wetlands by keeping the flow going into this area. Moving forward in trying to achieve the goals of the state's coastal master plan in my opinion is a win ,win for everyone . I have witnessed more land gained in areas that are not controlled by a freshwater diversion structure. This is a gift. I appreciate you considering this request. Thank you Albertine M. Kimble

From: Miles, Sam
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass
Date: Friday, August 30, 2024 8:11:50 AM

Dear Mr. Lahare,

I am writing to you as a member of the board of directors of the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL has been very engaged with the Corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

I would like to see Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new EA and plan to install a sill and sediment retention devices. I am grateful that the Corps is considering both navigation on the river and the ecosystem adjacent to it.

While we are glad to see the latest draft of the plan will not seal off the pass, I am asking that the Corps to consider how it can be improved further. For instance, can the notch in the sill be at a lower depth to allow more sediment to enter the pass? Can the SREDs be designed to better reflect the Corps mandate to enact nature-based solutions? And can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf?

I congratulate the Corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments.

Thanks,

Sam Miles | Vice President, Corporate Development
INTERNATIONAL-MATEX TANK TERMINALS
400 Poydras Street, Suite 3000
New Orleans, LA 70130
Office (504) 619-2322
[redacted]
Email SamMiles@imtt.com

From: Rob Gardiner
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass
Date: Friday, August 30, 2024 10:10:24 AM

Dear Mr. Lahare,

I want to comment on the plan to add rocks to build a sill beneath Neptune Pass. I have been a member of the CRCL board for six years and have followed the development of new land in Quarantine Bay for some time now.

I appreciate the need to have some control over the river crevasses in order to protect shipping, and I believe that the lower Mississippi River study will lead us to some new conclusions about how to manage the river more successfully. It is in this larger context of the river management system that I offer these comments.

Quarantine Bay is being changed for the better, as wetlands are built through the expansion of Neptune Pass. While this may seem like a good thing, the location that far down river will not be sustainable for long. Looking far into the future, the entire Bird's foot delta is unsustainable. We need to replenish wetlands further inland in areas where river sediments can provide replenishment over a long time.

With these multiple objectives in mind, I support some restriction of the free flowing Neptune Pass, as long as the Corps is willing to encourage deposition of River waters and sediments in a more targeted way to support wetlands restoration efforts on both sides of the River. The sill should include a low slot to allow release of some waters at moderate river levels, and generous releases in high water conditions.

Please treat the Neptune Pass decision as part of the larger scale solution to restoring healthy wetlands where they can be sustained by the most aggressive management schemes that imitate natural sediment deposition processes throughout South Louisiana.

Robert Gardiner
[redacted]

August 30, 2024

U.S. Army Corps of Engineers, Regional Planning and Environment Division, South
attn: Mr. Mark Lahare, Environmental Protection Specialist
New Orleans Environmental Branch, CEMVN PDS-R
7400 Leake Avenue, New Orleans, Louisiana 70118

RE: Neptune Pass Rock Closure, Environmental Assessment and Finding of No Significant Impact (FONSI), EA #589

Dear Mr. Lahare,

Restore the Mississippi River Delta (MRD) is a coalition of national and regional nonprofit organizations working to ensure an equitable, safer and flourishing coast for Louisiana's communities, ecosystem and economy. We are represented by conservation, policy, science and outreach experts from the National Wildlife Federation, Environmental Defense Fund, National Audubon Society and Pontchartrain Conservancy. As a coalition with long-standing interest in coastal Louisiana, we appreciate this opportunity to provide comments on the EA #589 related to the proposed Neptune Pass Rock Closure in Plaquemines Parish.

Neptune Pass is alive and teeming with a diversity of birds, other wildlife and plants. Like in other parts of Louisiana's coast connected to rivers such as Wax Lake Delta and Mardi Gras Pass, Neptune Pass is creating a vibrant, abundant habitat and underscores the need to use our rivers to maintain the bounty of our coast for wildlife and people into the future. We appreciate the effort made by USACE following the 2022 draft EA to re-evaluate the proposed action in Neptune Pass based on public feedback and modeling to formulate a solution that incorporates a more nature-based solution to reduce flow through the pass and that is more appropriate for this growing and active area of the East Bank of the Mississippi River.

Science

As you are aware, as science advocates we have invested our own funding in developing critical science for Neptune Pass, and research is ongoing. Thank you for meeting with us to discuss these initial results in June of 2022, and again in January of 2023. In the spirit of partnership, we remain committed to sharing our most current science with Corps personnel, as conducted by Dr. Alex Kolker, Dr. Christy Swann and Dallon Weathers, on our behalf.

Since the first draft release in 2022, a science partnership between the Louisiana Coastal Protection and Restoration Authority and our coalition was developed to study Neptune Pass' sediment mass and volume balance. This study investigated a fundamental question raised in the 2022 EA about whether the land being built in Quarantine Bay is from sediment coming solely from erosion and expansion of the channel or if significant quantities from the river are also being deposited. This work concluded that there is more sediment in Quarantine Bay than what could come solely from erosion and expansion of the channel. This work was shared with the Corps team too, and we appreciate the opportunity and the positive reception (Kolker et al. 2024).

Proposed Neptune Pass Closure

The proposed reduction in flow through Neptune Pass would be achieved using an inlet structure and outlet structures. The proposed inlet structure in the EA would consist of a stone sill with a 100-foot-wide notch with a depth of 26 feet. We appreciate the inclusion of this deeper notch to accommodate recreational and commercial boat activity through the pass. This deeper notch will also allow the coarser sediment carried deeper in the river's water column to enter the pass which could benefit land-building in Quarantine Bay and reduce shoaling in the navigation channel.

The outlet structures would consist of approximately 20 V-shaped Sediment Retention Enhancement Devices (SREDs) in Quarantine Bay to help reduce the velocity of water coming through the stone sill, reducing the hydrologic head differential. While we understand the focus of this EA is reduce water flow through the pass, we would like an opportunity to discuss the design and placement of the SREDs that could create multiple benefits for river navigation and the ecosystem.

Additionally, we appreciate the inclusion of nature-based solutions in the project concept but would like to further discuss the less natural use of rock and geotextiles in the building design. We would appreciate the opportunity to share the best practices of several partners who have constructed terracing projects in nearly this exact footprint with several years of monitoring conducted which we believe is relevant to this project and project footprint.

The current EA shows significant improvement and innovation over the 2022 EA. However, there are still lingering questions about the future of the lowermost river. The rapid formation of Neptune Pass, as well recent changes in flow through the Fort St. Philip crevasses, indicates that the dynamics in the lowermost river are changing and this change is likely to continue as sea level continues to rise and the delta continues to subside. Given the expansion of Neptune Pass is likely a result of some of those long-term changes in dynamics, has the Corps considered impact that a partial closure of Neptune Pass will increase pressure somewhere else in the vicinity, increasing flow through another pass.

Finally, we have questions related to the funding and timing of construction, which were not detailed as part of the assessment. Again, as a minimal standard, this information should be shared with the stakeholders of this area and the public who use this area frequently.

Transparency

We are disappointed in the release of the draft environmental assessment for the proposed Neptune Pass Rock Closure for a public review; in fact, we cannot say for certain when the official comment period began. Information was shared with some, but not all, via USPS, as well as by word of mouth prior to a delayed posting on the "News" portion of the USACE NOLA website. A best practice would have been to share this information with all those that submitted comments on the 2022 EA at a minimum electronically.

In addition to being community partners that live and work here within the Corps New Orleans District, we are financial stakeholders as well—several of our partner organizations in the non-profit community have supported projects within the footprint of Neptune Pass, including funding, capacity and other resources, to complement the investment of federal funds, so we should have been notified of both the considerable delay and following release of this EA.

In summary, through this assessment, the US Army Corps of Engineers had an opportunity to better balance navigation needs and ecosystem benefits in the Mississippi River Delta, and we believe this outcome is a step in the right direction of linking basin management to the Corps priority of navigation. As a next step, we would appreciate the opportunity to further discuss in person the solutions proposed for the Quarantine Bay area.

With this more robust scientific analysis and continued transparency and communication to stakeholders, we can ensure decisions made today will not be based on a single issue or stakeholder group, which could result in perpetual problems, including harmful impacts to a flourishing ecosystem and significant additional costs in the future.

We would like to respectfully request a response to these comments, in addition to coordinating an in-person meeting, and we look forward to continuing to work with you for a just, climate resilient coast where people and nature thrive.

Sincerely,

Simone Maloz
Campaign Director
Restore the Mississippi River Delta

Kristi Trail
Executive Director
Pontchartrain Conservancy

Lauren Bourg
Director, Mississippi River Delta Program
National Audubon Society

Amanda Moore
Senior Director, Gulf Program
National Wildlife Federation

Will McDow
Senior Director, Climate Resilient Coasts & Watersheds
Environmental Defense Fund

Pontchartrain Conservancy

SCIENCE FOR OUR COAST. SINCE 1989.

August 30, 2024

Mr. Mark Lahare
U.S. Army Corps of Engineers, Regional Planning & Environment Division, South
New Orleans Environmental Branch, CEMVN PDS-R
7400 Leake Avenue
New Orleans, Louisiana 70118

RE: Neptune Pass Rock Closure Plaquemines Parish, Louisiana Environmental Assessment #589

Dear Mr. Lahare,

At Pontchartrain Conservancy (PC), our mission is to drive environmental sustainability and stewardship through scientific research, education, and advocacy. PC's advocacy is grounded in science and it is for this reason that we respectfully submit these comments regarding "Neptune Pass Rock Closure Plaquemines Parish, Louisiana Environmental Assessment #589"

First and foremost, we are encouraged by the amount of effort that was made in this EA to address our concerns with the original EA from 2022. Out of the alternatives considered and eliminated, the proposed action is the culmination of many considerations the USACE has made that will address both navigation and environmental concerns. In our opinion this is a shining example of how navigational needs can be balanced with environmental benefits.

The proposed rock closure structure differs significantly from the original 2022 version. Specifically, the deeper notch is a much-improved design. This allows more sediment-rich water to enter the pass, which achieves the positive impact on wetlands and land building while maintaining the desired navigation outcome. Similarly, we are pleased to see that the outfall structures, Sediment Retention Enhancement Devices (SREDs), are given considerable attention in the proposed action. We are encouraged to see USACE make a deliberate effort here. We recognize the current SREDs configuration in the EA is approximate; however, we urge USACE to consider SREDs designs and geometries that are congruent with natural deltaic mechanics to maximize land building.

[NEW CANAL LIGHTHOUSE]

[MAILING ADDRESS]

[CORPORATE OFFICE]

As coastal advocates and scientists, we see monitoring as a long-term investment and a key pathway to preserving our coast. As sediment flows into the outfall areas adjacent to Neptune Pass and ultimately creates a new delta system in the coming years, our scientists will continue to monitor the area and gather data on this important waterway. We truly value our relationship with USACE and as we move forward, we hope to maintain an open dialogue and share information with your team regarding Neptune Pass.

Sincerely,

Kristi Trail, P.E.
Executive Director

From: Robert Gorman
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass Public Comments
Date: Saturday, August 31, 2024 4:14:08 PM

Dear Mr. Lahare,

I am writing to you as a member of the Coastal Advisory Council of the Coalition to Restore Coastal Louisiana (CRCL) and as a founder of this organization.

CRCL has been very engaged with the Corps and other parties on Neptune Pass and I have written before. The new delta forming in Quarantine Bay and the surrounding area is extremely important to all of South Louisiana, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

I would like to see Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new EA and plan to install a sill and sediment retention devices. I am grateful that the Corps is considering both navigation on the river and the ecosystem adjacent to it.

While the plan is a marked improvement over the previous proposal that would have largely sealed off the pass, I am asking, in conjunction with CRCL, that the Corps consider how it can be improved further. **For instance, can the notch in the sill be at a lower depth to allow more sediment to enter the pass? Can the SREDs be designed to better reflect the Corps mandate to enact nature-based solutions? And can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf - too much of this land building sediment is already going deep into the shelf and we're not taking advantage of this resource.**

I congratulate the Corps on the plans outlined in the EA and I'm happy to submit comments. I look forward to seeing these suggestions added to the plan.

Yours Truly,

Robert D. Gorman
[redacted]

From: Marie Gould
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass
Date: Saturday, August 31, 2024 12:34:04 PM

Dear Mr. Lahare,

Please keep Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation.

While the plan is a big improvement over the previous proposal, the corps needs to consider improving it further. For example:

1. Can the notch in the sill be at a lower depth to allow more sediment to enter the pass?
2 Can the SREDs be designed to better reflect the corps mandate to enact nature-based solutions?
3. Can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf?

Marie Gould
Member, Advisory Council
Coalition to Restore Coastal Louisiana

August 31, 2024

Mr. Matt Roe
U.S. Army Corps of Engineers, Regional Planning and Environment Division, South
New Orleans Environmental Branch, CEMVN PDS-R
7400 Leake Avenue, New Orleans, Louisiana 70118
matt.m.roe@usace.army.mil

Re: Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Neptune Pass Rock Closure EA #589

On behalf of our more than seven million members and supporters across the United States, the National Wildlife Federation's (NWF) Gulf Program appreciates the opportunity to provide comment on the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Neptune Pass Rock Closure Plaquemines Parish, Louisiana Environmental Assessment #589 (EA)). With staff on the ground in Louisiana, the National Wildlife Federation is deeply committed to advancing solutions to support healthy waters and sustainable ecosystems for people and wildlife. Louisiana's coastal wetlands provide critical habitat for recreationally and commercially important fish and wildlife and help buffer storm surge for nearby communities. However, these vital wetlands are disappearing across most of the coast due to multiple causes, including the lack of sediment input from the Mississippi River. In recognition of their importance, billions of dollars from the state and federal governments are being invested to restore these wetlands to create a more sustainable future for Louisiana.

The National Wildlife Federation appreciates the work that has gone into significantly improving the 2024 EA as compared to the 2022 EA. We also appreciate the Corps' continued dialogue with us about Neptune Pass to share science and find solutions that have multiple benefits for the navigation channel and the ecosystem. It is critical that science be used to drive decision-making to continue to have a robust system in the lower Mississippi River that supports navigation as well as the health of the ecosystem.

However, we continue to have concerns related to the Corps' modeling and its proposed plan for Neptune Pass. It is not clear how reduction in flow through Neptune Pass may increase pressure at other outlets during high river events. The proposed SREDs, while innovative, appear to be overengineered for the needs of the project, relying on stones and geotextile, and driving up project cost. It is also unclear from the EA how modeling, planning, and design has informed the placement, shape, and configuration of the proposed SREDs, as discussed below.

Importantly, our ability to meaningfully assess the Corps' modeling and the proposed plan is hampered by the lack of transparency in the EA. Critically, we require, and formally request, that the Corps make all the modeling and data that supports the planning and design of the inlet and outlet features outlined in the EA available to the public as quickly as is practicable as required by law.[1] This includes the Draft Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure or any modeling on the proposed SRED features. This document is critical to understand the design and impact of the SRED features on both reducing flow through Neptune Pass and the potential impact on the delta that is forming in Quarantine Bay.

The process used by the Corps to announce the availability of the 2024 EA has also created significant barriers to meaningful public input. The Corps' release of the 2024 EA was not adequately communicated to the public, and the actual deadline for submitting public comments remains unclear. For example, letters were sent out to some that provided a due date for the comments that conflicts with the due date published on the Corps website. In addition, the 2024 EA was not made available on the Corps' website until August 7, 2024, providing the public with just 25 days to review and submit comments by what we understand to be the August 31, 2024 deadline. This is well-short of the typical 30-day public comment period that already provides a very limited amount of time to provide comments.

Since 2022, we have funded and coordinated a data collection effort through Dr. Alexander Kolker, Dr. Christy Swann, and Dallon Weathers, in Neptune Pass and in Quarantine Bay to better understand how the pass is changing with time and the sediment deposition, and even land building, that is occurring in Quarantine Bay. We have also coordinated, and co-funded work with Louisiana's Coastal Protection and Restoration Agency (CPRA) to explore a sediment volume and mass balance with the expansion of Neptune Pass. This work estimates 113 million cubic feet of sediment in excess to that eroded by the expansion of the channel has been deposited in Quarantine Bay (Kolker et al. 2024). NWF is currently funding additional work in the area to continue to monitor the development of land in Bay Denesse and the large subaqueous delta in Quarantine Bay. We will share that data as it becomes available and would like

[1] 33 U.S.C. § 2342 (emphasis added) (the "Secretary shall make publicly available, including on the Internet, all data in the custody of the Corps of Engineers on . . . the planning, design, construction, operation, and maintenance of water resources development projects . . . as quickly as practicable after the data is generated by the Corps of Engineers.").

the opportunity to further discuss the design, configuration and placement of the SREDs.

We offer the following detailed comments:

The EA provides a clear target for the flow reduction through Neptune Pass, but not how that target flow was derived. The purpose of the structures proposed at Neptune Pass is to eliminate a navigational hazard in the Mississippi River. While Neptune Pass has existed for decades, the 2019 Mississippi River flood saw the pass expand up to 15% to 17% of the Mississippi River's flow. The EA proposes to use an inlet and outlet features to reduce the flow to 6% of the Mississippi River's flow. This is an improvement over the 2022 EA which did not specify target flow. However, it is unclear why this is the target beyond that this was the historical flow rate prior to expansion of the channel. There is an increasing trend in water loss from the navigation channel outside the east side of the river due to bank failures (Allison et al. 2023). Reducing flow through Neptune Pass to 6% of the river' flow may reduce navigation issues, such as shoaling, in the vicinity of Neptune Pass, but this action could create additional pressure at other locations during future high river flow events, inducing bank failures at other nearby passes. While this question may be outside of the scope of this EA, we encourage the Corps to think large-scale and long-term about management of the lowermost Mississippi River. The Lower Mississippi River Comprehensive Study is underway and should look at how to manage the river to today and the future, rather than the past.

Inclusion of a deep notch in the inlet structure will provide recreational and commercial boat access and will likely allow coarser sediment to flow into Bay Denesse and Quarantine Bay. In the 2022 EA, the proposed structure in the Neptune Pass channel was likely to fail under a high river event. The modifications of the structure to include both inlet and outlet features will likely reduce and keep Neptune Pass flow within the target. The inclusion of a notch at the inlet structure at the confluence of Neptune Pass and the Mississippi River is a welcomed improvement in the structure design. This will allow recreational and commercial boat access to Bay Denesse, Quarantine Bay, and beyond that are currently using the pass. This desire for a deep notch has been expressed by shrimpers, crabbers, oil & gas, charter guides, and other key stakeholders. Additionally, the deep notch will allow for sediment, carried deeper in the river's water column to be captured by the pass. This flow of sediment is critical to the coastal wetlands and subaqueous delta in Quarantine Bay.

The outlet feature SREDs are a nature-based feature that can work in tandem with the inlet structure to reduce flow through Neptune Pass, but the features as described in the EA are overengineered, driving up cost of the project. We applaud the innovation of including nature-based features as the outlet features in the EA. Incorporation of these features in addition to the inlet structure will reduce flow through Neptune Pass and will likely help prevent episodic expansion during a high river event. Nonetheless, we

believe that the SREDs described in the EA are overengineered. Earthen SREDs have been used in the West Bay Diversion outfall to slow water flow and enhance sediment deposition. Despite several high river events and the expansion of other nearby passes, the flow through West Bay has been stable since 2006 (Allison et al. 2023; Henkel, 2022). We encourage the Corps to construct the proposed SREDs only out of earthen material from the bay or dredge from the river. While there will likely be erosion of the SREDs over time, the SREDs will also encourage sediment deposition in Quarantine Bay, which will further reduce the head differential between the river and the bay. In addition, fortifying the SREDs may induce erosion of the marshes flanking Quarantine Bay which have been expanding over the last two years. The use of rock and armoring in SRED construction will likely increase the cost of the project with little added benefit. Further, it is unclear from the EA to what extent modeling has been used in the shape, placement and configuration of the SREDs. We request any data or modeling results that informed these SREDs and are eager to participate in any further discussion about the SREDs.

Finally, Neptune Pass is a deltaic feature of high importance because Louisiana is losing coastal wetlands at an alarming, crises-level pace, which has prompted a massive resource investment in restoration. Louisiana's coastal wetlands provide critical habitat for recreationally and commercially important fish and wildlife and help buffer storm surge for nearby communities. At the same time, a consistent navigation channel is important to the local and national economy. Both of these things have high value to people, communities, wildlife and industry of Louisiana and, as a result, science must be used to analyze select actions that best serve both the river and the wetlands. We thank the Corps for reconsidering the proposed action laid out in 2022 EA and we are encouraged by the innovation of proposed action outlined in the 2024 EA.

Thank you for your careful consideration of these comments. We look forward to continued discussion and will submit the final studies that are referenced in this comment letter immediately upon completion.

Sincerely,

Amanda R. Moore
Senior Director, Gulf Program
National Wildlife Federation

References

Allison, Mead A., et al. "Impact of water loss on sustainability of the Mississippi River channel in its Deltaic Reach." *Hydrological Processes* 37.10 (2023): e15004.

Kolker, Alexander, et al. "Distributary Development In A 21 st Century River: The Evolution of Neptune Past And Its Delta, The Largest New Offshoot Of The Mississippi River." *Authorea Preprints* (2024).

From: Roe, R Matthew (Matt) CIV USARMY CEMVN (USA)
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: FW: [Non-DoD Source] EA # 589
Date: Tuesday, September 3, 2024 9:58:13 AM

Hi Mark,

Sent on the last day of the comment period.

Matt

From: KENNETH RAGAS [redacted]
Sent: Saturday, August 31, 2024 2:21 PM
To: Boyett, Ricky D Jr CIV USARMY CEMVN (USA) <Ricky.D.Boyett@usace.army.mil>
Cc: Brown, Gary L ERDC-CHL-MS <Gary.L.Brown@erdc.dren.mil>; AskTheCorps MVN <askthecorps@usace.army.mil>; Axtman, Timothy J CIV USARMY CEMVN (USA) <Timothy.J.Axtman@usace.army.mil>
Subject: [Non-DoD Source] EA # 589

Mr. Boyette,
In EA # 589 for "Neptune Pass" was there any history included pertaining to the residents of the town of Neptune Louisiana which historically existed at that location? Some say that a local canal was constructed by the inhabitants of Neptune, La.to gain entrance to the outer bays area. It did not connect to the Mississippi River. In 1971 mapping of the area a complete east bank Mississippi River extended from Ostrica, La. to Baptiste Collette Pass. There were no gaps (crevasses) in that levee at that time. The area was used mostly as cattle pasture by a local butcher from the west bank. Also, Neptune was said to have the only practicing Phyician (doctor) on the east bank between Ostrica, La. and Fort St. Philip. There is a historical reference to him. There was an original roadway on the east bank when the fort was built in 1832. That was when the only passage was on the natural Mississippi riverbanks.
Lots of history there.
Fort St. Philip and Fort Jackson were very active in the Civil War. The Yankees fought their way past them and finally reached New Orleans, La.
Checking the history books may offer a more complete story of that area.
Is the process of public input to EA # 589 still open?
Sincerely,
Kenneth Ragas

Alexander S. Kolker, PhD
Louisiana Universities Marine Consortium
and
The Coastal Climates Institute
[redacted]

Dear US Army Corps of Engineers:

I am writing this letter to respond to the US Army Corps of Engineers' Draft Finding Of No Significant Impact in Environmental Assessment #589 for the Neptune Pass Rock Closure in Plaquemines Parish, Louisiana. (Referred to as the EA in letter.)

I appreciate the seriousness of the situation the Army Corps Faces. On one hand, Neptune Pass is building a large delta in Quarantine Bay - which could become one of the largest land-building projects in Louisiana's history. On the other hand, Neptune Pass could also lead to navigation problems, including the development of shoals and hazardous currents in the Mississippi River.

A situation of this seriousness calls for robust science and engineering to support whatever activities are needed. While this present EA and the report, "Neptune Pass Model Report: Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure,* (referred to as the Model Report here) provide additional information, serious questions remain. I do not think that the information presented in the EA and the Model Report can fully support the finding of, "No Significant Impact." These reports cannot rule out the potential for significant adverse impacts of the proposed actions. As such, I am asking the US Army Corps of Engineers to provide additional information to clarify their findings and conclusions.

I highlight several major areas where the public will be better served by more information and analysis.

1) Inlet Structure: Potential Adverse Impacts

It is possible, if not likely, reducing the quantity of water entering Neptune Pass could increase the quantity of water flowing through other nearby outlets. Simply put, the Corps could be moving the problem they are trying to solve, rather than directly address it. For reference, there are many other outlets in the lower Mississippi River near Neptune Pass, including a channel adjacent to the Ostrica Channel, and the Fort St Philip crevasse complex.

Figure 24 of the Model Report indicates substantial scour in multiple channels near Neptune Pass. It is possible, if not likely, that some of the benefits that the Corps is trying to

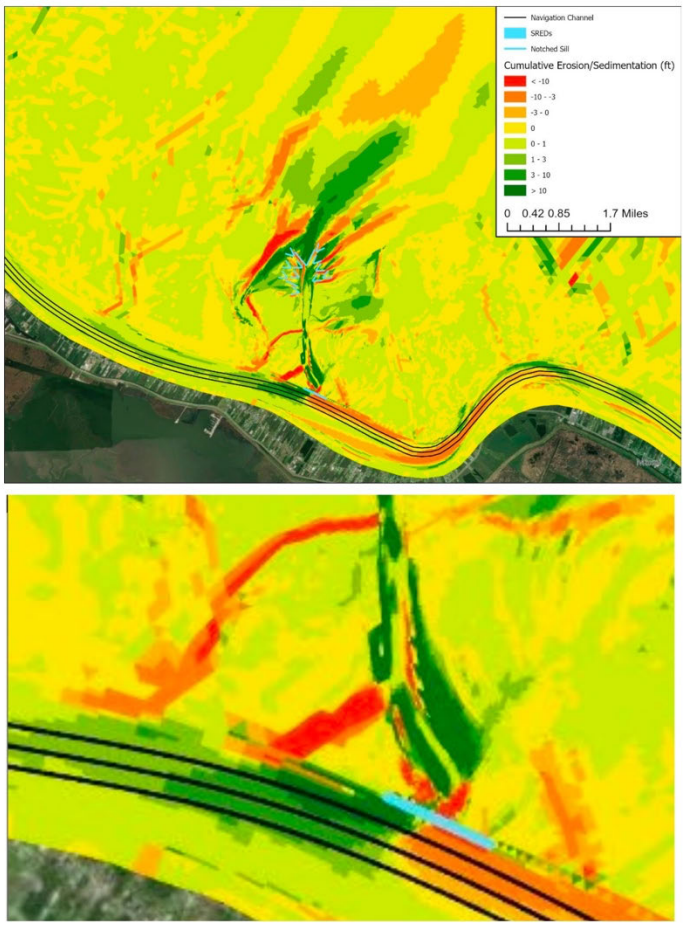


Figure 1. Map of predicted erosion/deposition in the Model report - Figure 24. Note the >10 ft of predicted erosion just downstream of the inlet structure. The Army Corps should investigate whether this will lead to an undermining of the inlet structure. Also note the >10 ft of erosion in some of the upstream passes. This suggests that partially closing Neptune Pass could increase scour- elsewhere. The implication is that the Corps' plan could simply be moving the problem, rather than solving it.

obtain could be undone by this extensive scour, and that new problems- to navigation and shipping could form. This potential needs to be evaluated in much more serious detail before proceeding.

Figure 24 of the Model Report shows the significant potential for scour to occur by the proposed Neptune Pass inlet structure. The predicted scour directly behind the inlet structure is predicted to be about 10 feet. This strikes me a relatively large amount of scour. Furthermore, if the Mississippi River experiences more large floods than used in the Model Report (which is increasingly likely with climate change), the amount of scour could be even greater. The Army Corps needs to evaluate whether the extensive scour in Neptune Pass directly downstream of the inlet structure is enough to undermine the inlet structure from the back side. If such an undermining event occurred, it could result in significant impacts to the Mississippi River- including the development of hazardous river currents and downstream shoaling. This is a potential for structure undermining should be evaluated by the Army Corps in the near term.

It is unclear what the net impacts of the Corps' action will be on dredging in the Mississippi River. While Figure 24 shows that there will be increased erosion downstream of Neptune Pass, it also shows increased deposition upstream of Neptune Pass. It is possible that the Corps is simply moving the problem, rather than seriously addressing it.

2) Impact of subsidence efficacy and environmental impacts of the inlet and outlet structures.

The Army Corps has not properly addressed the geology and geotechnical characteristics of the landscape. I am concerned about the potential for the rocks that will be placed in both structures to sink into the sediment. The poorly consolidated sediments that make up the Mississippi River Delta are highly prone to subsidence, compaction, and deformation. To overcome this, most structures in Louisiana are built on pilings that extend deep into the earth. Yet, the design in the Environmental Assessment does not show the presence of any structure to prevent subsidence or disruptions to the structure's foundation. Furthermore, there is no evidence that boring or sediment cores were collected to allow the Army Corps to evaluate whether subsidence-control methods are needed.

This lack of information is a critical concern because the proposed project will involve lots of stone. The structure at the entrance to Neptune Pass will use about 168,000 tons of stone, with an additional 20,000 of paving stones on top of this structure. The outlet structure will require 250,000 tons of armor stone and 50,000 tons of core and bedding stone. For reference, the dome of the Superdome contains only 20,000 tons of steel (https://www.caesarssuperdome.com/assets/doc/presskit-1-874851cf94.pdf). And yet, there is no plan to address this weight. Indeed, the section on the geology (3.1.4) references geological deposits in the general area but makes no note of how this large heavy structure would impact/be impacted by the poorly consolidated sediments of this region.

There is a reasonable potential that one of the structures could fail because the Army Corps has failed to address the geological and geotechnical characteristics of the landscape. Since the potential for a structural failure has not been evaluated the impacts of such a failure, on navigation and the environment have not been properly evaluated. In this critical area, the document simply does not provide enough evidence for a reasonable person to conclude that there will be no significant impact.

The Army Corps is hereby requested to provide geotechnical data and related engineering models to show that the structures will not subside or sink into the landscape, or that the foundation will not be compromised. Useful datasets are likely to include engineering borings/sediment cores, seismic surveys, and geological modeling. The Army Corps should also evaluate the impacts on shipping, navigation, and the environment if either of the structures collapses or is compromised.

3) Outlet Structure: Efficacy And Impacts

While I very much appreciate the effort that went into the conceptualization of the outlet structure, I still have many questions about whether this structure will work as intended.

Indeed, the engineer(s) who came up with the idea of using an outlet structure to reduce flow should be commended for their work. This idea is novel (at least I have never seen it before), and could potentially be considered a nature-based solution that works in concert with the theory of delta geology. For example, Roberts' (1997) theory of the delta cycle

describes how rivers discharge sediment into an open bay. (See Roberts, 1997, Dynamic Changes of the Holocene Mississippi River Delta Plain: The Delta Cycle, Journal of Coastal Research, Vol. 13, No. 3 (Summer, 1997), pp. 605-627). When a river enters into an open bay, water velocities decrease, and the subsequent deposition of sediment builds (if available) land. Eventually, so much land is built that the system becomes hydrodynamically inefficient, which directs the flow of the crevasse back into the river. The SREDs in the outlet structure appear to work on this concept - reducing the hydrodynamic efficiency of the crevasse to eventually redirect flow back into the river. I tip my hat to the engineer(s) who developed this idea and would like to see this concept developed in more detail.

However, I still have questions about this structure, which include:

A. It is possible the SREDs could erode, reducing their effectiveness. It appears that the Army Corps is concerned about the erosion of the SREDs, as they are lined with, "250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile." (Qute from the EA.) This seems like an extensive amount of material and would probably not be necessary if the Army Corps did not think that erosion was likely. Erosion of the SREDs would reduce their effectiveness, potentially leading to environmental impacts elsewhere. The Army Corps should investigate the potential for the SREDs to erode, and the impacts to the project and the environment if this erosion took place.

The Model Report indicates that erosion is likely. The report indicates that velocities near the SREDs are predicted to be near 5- 12 feet per second, clearly fast enough to erode many coastal sediments. The predicted shear stress values are also high enough to promote erosion.

The Army Corps needs to more closely examine the impacts of erosion on the long-term stability of the SREDs. I also call on the Corps to more closely examine the potential for other SRED designs to make the SREDs more effective. Could the SREDs be placed in a slightly different location, with a slightly different morphology, to reduce erosion and increase long-term effectiveness? There is value in the concept of using SREDs to reduce the hydraulic efficiency of a crevasse, and the public would be well served to see this approach receive additional technical rigor.

B. As described above, there is also the potential for the rocks that are part of this outlet structure to sink and subside into the mud. This could create several problems including

* A reduced efficacy of the outlet structure,
* Hazards to navigation if these sunken stones and not well-marked.

* Unintended side impacts to the environment.

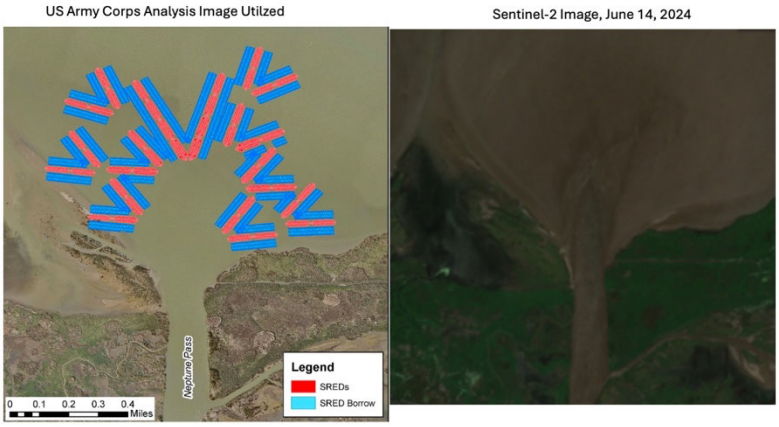


Figure 2. Comparison of two satellite imagess. The left image was used by the Army Corps in the present Environmental Assessmenet. The image on the right is a Sentinel-2 image from 2023. It appears to indicate the the proposed SREDs will touch existing wetlands.

The Army Corps needs to produce geotechnical information that shows the potential for subsidence in the outlet structure, and the impacts of subsidence on project performance and environmental impacts. This information should include items such as engineering borings/sediment cores, and compaction/compression modeling.

4) Water Quality Impacts

There is the potential for the channel of Neptune Pass to become a hypoxic or anoxic environment if the flow into Neptune Pass is reduced. Large deep holes in general have the potential for hypoxia to develop, and Neptune Pass is no different. The Army Corps should investigate the potential for hypoxia in the Neptune Pass channel, and present data documenting this investigation, before concluding that there is no significant impact.

5) Impact to Wetlands.

The Environmental Assessment states that "Implementation of the proposed action would not result in any direct impacts to wetland resources. Construction of the inlet feature would tie into the existing bankline adjacent to Neptune Pass but would not overlap any existing vegetated wetlands."

I am concerned that this information is not correct, and that it contradicts the Model Report. The last paragraph on p3 of the Model Report contains the following text. "Conversely, there are indications that the expansion of Neptune Pass is promoting positive impacts on environmental quality. Recent aerial imagery and observations show that sediment conveyance through Neptune Pass is aiding land building in Quarantine Bay (Quarantine Bay is a shallow embayment that serves as the immediate receiving water for Neptune Pass), especially near engineered marsh terraces built by Ducks Unlimited, and in Bay Denesse, which is the location of an environmental monitoring laboratory operated by the Water Institute. Although an accurate estimate of Mississippi River sediment being diverted through the pass has not been established, continued growth of the subaqueous delta in Quarantine Bay and the vegetated, subaerial delta in Bay Denesse, as confirmed by aerial imagery, suggests that the pass could be harnessed for its land building processes."

Clearly, the Army Corps is aware that lands are developing in Bay Denesse and Quarantine Bay, and that the transition from subaqueous habitat to vegetated habitat has either happened or could reasonably happen in the not-too-distant future.

Furthermore, satellite imagery indicates that there is a large area that includes about 100 acres of wetlands that are developing north and west of Neptune Pass (Fig 2). These wetlands have developed - in part from sediments sourced from Neptune Pass. (There have been other activities in the area, including the construction of terraces by Ducks Unlimited). An analysis of satellite images appears to show that the outlet structures will touch these wetlands. Furthermore, the plan for the construction of the SRED calls for locally sourced sediments to be used. It appears likely that these sediments could come from areas where the wetlands are located.

There also is a smaller island that is emerging near the outfall of Neptune Pass. This island is emerging and beginning to vegetate. As such, it is a wetland that should be considered. There are a series of islands in Bay Denesse that have developed in the time since Neptune Pass developed. It is probable that these wetlands, which are about 150 acres in size total, have been augmented by the growth of Neptune Pass. The Army Corps should investigate the impact of their actions on the growth of wetlands in Bay Denesse.

Figure 3. Sentinel 2 image of Neptune Pass and its delta from December 28, 2023. It shows a very large delta has formed downstream of Neptune Pass.

Finally, Neptune Pass is contributing to the development of a large delta (Fig. 3). This appears to be the largest new delta in North America. While relatively few wetlands have developed yet, the entire area is about 3,000 to 5,000 acres of shallow and potentially emergent lands. These shallow lands could potentially develop into wetlands. The Army Corps should more closely consider the impacts to this delta and its potentially emerging wetlands, as a result of their actions.

Thank you very much for considering this letter. I would be happy to discuss this issue with you in more depth if you would like. I can be reached via email at [redacted]

Sincerely,
Alexander S. Kolker, PhD
Louisiana Universities Marine Consortium And The Coastal Climates Institute

LOUISIANA WILDLIFE FEDERATION
The voice of Louisiana's wildlife and natural resources since 1940.

PO Box 65239, Baton Rouge, LA 70896
8480 Bluebonnet Blvd. Suite F, Baton Rouge, LA 70810
(225) 344-6707
www.lawildlifefed.org

September 2, 2024

Col. Cullen A. Jones, PMP
Commander and District Engineer New Orleans District

Prepared by Mark Lahare, Environmental Protection Specialist
Emailed mvnenvironmental@usace.army.mil
U.S. Army Corps of Engineers, Regional Planning and Environment Division, South
New Orleans Environmental Branch, CEMVN PDS-R
7400 Leake Avenue New Orleans, LA 70118

Re: Neptune Pass Rock Closure EA #589 and Draft Finding of No Significant Impact (FONSI)

Dear Col. Jones,

Thank you for the opportunity to comment on the "Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Neptune Pass Rock Closure EA #589" and "Draft Finding of No Significant Impact (FONSI)."

Louisiana's coast is disappearing from a combination of hurricanes, sea level rise, repercussions of flood control and navigation activities, and natural processes. As we noted in our 2022 comments, the single largest action that can be taken to help mitigate some of this loss is to allow the Mississippi River to do what it has done for thousands of years: build land with its sediment and nutrient-rich water. Neptune Pass has provided Louisiana with yet another connection to the river that has resulted in abundant habitat filled with birds, wildlife, and plants – just as is occurring in Wax Lake Delta and Mardi Gras Pass.

Louisiana is spending billions of dollars on large-scale restoration projects to reverse declines in estuarine habitat for fisheries, wildlife, and sustainable natural resources. The emergence of Neptune Pass has resulted in the creation of a vibrant habitat teeming with biodiversity and it underscores the importance of reconnecting our river to the surrounding estuary.

Although the current proposal is being pursued under a purely navigation authority, we commend the U.S. Army Corps of Engineer for finding innovative solutions that will both aid navigational safety and continue the work the river is doing to build land and habitat in the outflow area of Quarantine Bay. These improvements from the 2022 proposal include continuing the connection of the river to wetland areas to the east, the introduction of Sediment Retention Enhancement Devices (SREDs), and pushing back the allowed flow to the 2019 instead of 2016 levels. These changes from the 2022 proposal are all enormous improvements for the benefit of wildlife and fisheries in the area.

Thank you for bringing forward this innovative approach to Neptune Pass management that better addresses navigation concerns, the pass structure stability, as well as coastal advocate concerns about closing off this connection between the river and wetlands to the east of the river.

While we applaud the Corps' new design and responsiveness to previously stated concerns about a complete closure of the pass, the environmental assessment (EA) and FONSI raise a number of questions that are not currently included in the EA or FONSI, although they may have been a part of decision-making:

- The placement of the SREDs and construction of the structure at the river's edge will change the current landscape with channel evolution and sediment accumulation. How will the structure and SREDs be managed into the future to continue successful operation?
- What impact will the current design of the structure and SREDs have on the outfall area and what impact will that have on the system's operation and longevity?
- Is there an opportunity in the future to work with the Corps around the location and structure of the SREDs?
- What is the modeling, science, and decision-making processes that demonstrate the SREDs need to include 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile?
- With the fixed location armoring of the SREDs, how does that fit into long-term adaptive management of the closure and outfall area as sediment accumulates?
- With a goal of limiting flow to 80,000 cfs, it appears from supporting documentation that can be accomplished with SREDs alone, what additional benefit does the sill provide?

This innovative approach is the perfect opportunity for the Corps to engage local stakeholders and researchers in the design and placement of SREDs as this project design process moves forward.

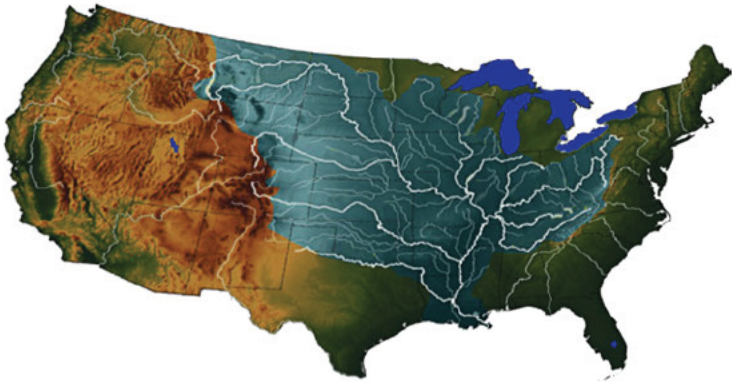
Louisiana Wildlife Federation is a statewide conservation organization representing more than 11,000 members and 23 affiliate organizations supported by hunters, anglers, hikers, paddlers, birders, campers, and other outdoor enthusiasts.

Thank you for the opportunity to comment on this important milestone.

Sincerely,
Rebecca Triche

Executive Director
Louisiana Wildlife Federation

BIG RIVER COALITION



Sean M. Duffy, Sr.
Executive Director
5600 Janice Avenue
Kenner, LA 70065

[redacted]

September 2, 2024

BIG RIVER COALITION COMMENTS
NEPTUNE PASS ROCK CLOSURE FONSI-EA #589

USACE-MVN
NEPTUNE PASS ROCK CLOSURE/Project Manager
Environmental Assessment #589
7400 Leake Avenue
New Orleans, LA 70118

Dear Mr. Crawford,

The Big River Coalition (BRC) is committed to "Advocating for a Mightier Mississippi River" to ensure the future of unimpeded navigation on the Mississippi River Ship Channel (MRSC) as one of the nation's fundamental natural resources and a true economic superhighway. The Coalition is committed to protecting maritime commerce across the Mississippi River and Tributaries (MRT) while focusing on maximizing transportation efficiencies on the Mississippi River Ship Channel from Baton Rouge to the Gulf of Mexico. The Mississippi River and Tributaries project has an estimated $ 735.7 billion annual impact on the nation's economy and is responsible for approximately 2.4 million jobs (585,000 jobs on the Lower River – Cairo, IL to the Gulf of Mexico and 1.86 million plus jobs on the Upper River-Lake Itasca, MN to Cairo, IL and including the IL River). As the future of the MRT is shaped, it is imperative that navigation representatives strive to ensure that systematic approaches protect maritime trade by maintaining fully authorized channel dimensions, while also updating and maintaining our navigation infrastructure, specifically the locks and dams of the MRT system. The Big River Coalition missions are focused on securing increased funding from the Harbor Maintenance Tax and the Inland Users Fuel Tax, efforts to deepen the Mississippi River Ship Channel to 50 feet and to increase the beneficial use of dredged material or "Sediment Recycling."

Please accept the comments contained in this document from the Big River Coalition to confirm our support of the U.S. Army Corps of Engineers (USACE) plan to limit the flow at Neptune Pass at approximately Mile 24 Above Head of Passes. The Coalition supports the proposal although the BRC also has concerns about the amount of time it has taken to respond to the crevasse which quickly became a threat to navigation and the Lower Mississippi River Ship Channel as the crevasse is acknowledged to have grown exponentially during the Great Flood of 2019. The Coalition continues to express concerns about the following three crevasses all located on the eastern side of the Mississippi River from Belle Chasse to the Head of Passes: Bohemia Salinity Control Structure, Neptune Pass and Fort St. Phillip.

The following quotes are reproduced from the USACE's "DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI):

"Purpose and Need for the Action: The purpose of the proposed action is to eliminate a navigational hazard in the Mississippi River. Neptune Pass is a natural crevasse which existed prior to 1985 but has increased

significantly in size and flow during recent annual high river events, with a noticeable enlargement after 2019."

"In an effort to best reduce sedimentation within the Mississippi River attributed to the expansion of Neptune Pass, the location and dimensions of the proposed action were designed to approximately match the outlet before the riverside bank protection failed and the pass was allowed to develop."

"There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river."

"The increased flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 Above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during high river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside Neptune Pass."

"Public concern for maintaining some connectivity from the river to adjacent marsh areas in order to facilitate land gain was also considered in the elimination of a full closure structure design"

And,

"Additionally, an increase in dredging Mississippi River would be required to compensate for the diversion effects in the proposed action is not completed…There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river"

The Big River Coalition agrees with the proposed action to reduce the flow at Neptune Pass, but also questions the amount of time taken to respond to this rapidly growing crevasse. The growth of Neptune Pass has negatively impacted navigation since 2019, required emergency dredging in 2022 and contributed to the repeated saltwater encroachment during low water periods. The latter is strategically important as the USACE prepares to construct the saltwater sill for the third year in a row. The Coalition is also concerned as in multiple places the Draft FONSI refers to "public concern." The Coalition would like to better understand who the so-called "Public" is in this document, there are no communities, homes or businesses in this isolated reach of the river. The Coalition remains unaware of any land that has been built by the crevasse, often those calling this land building are standing in a foot or more of water while calling it new land. The Coalition wonders if these comments are indeed filed by members of the public or if the comments are made in support of Non-Government Organizations, especially considering the complexity of navigation, land-building through accretion of riverine sediments and no identifiable source for claims of land building in the Neptune Pass receiving area have been presented. The USACE has indicted that Neptune Pass is not a sediment rich environment, the Coalition assumes this means it is unlikely that Neptune Pass would accrete so-called land above the waterline.

The following statement is reproduced from the DRAFT ENVIRONMENTAL ASSESSMENT:

1.5 Public Concerns:

"Localized accretion has been observed within adjacent bays to Neptune Pass. Louisiana accounts for 80% of the continental United States' coastal wetlands loss (Williams et al. 1997), and some public support exists

for allowing Neptune Pass to remain open and unmodified to promote land gain and potential wetland establishment within these areas."

The Coalition supports this effort to control the loss of flow at Neptune Pass to support the path chosen by the USACE, clearly closing or reducing the flow of water loss from this crevasse is critical to promoting safe navigation. The Mississippi River Ship Channel is the nation's economic superhighway and threats to our greatest artery of trade should be acted upon promptly.

The following quote is reproduced from the Draft Environmental Assessment, this statement matches many of the concerns of the navigation industry.

"Construction of flow control features within Neptune Pass (inlet structure) and Quarantine Bay (outlet structures – SREDs) would decrease riverbank scour and erosion within the Pass and control water flow being diverted from the Mississippi River. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigation depths."

The Coalition would like to focus on just two words utilized in this quote, specifically "uncontrolled diversion" as the USACE's Mississippi River Commission previous ruled that all future manmade river diversions must be controlled. The difference in the MRC ruling here is between a structure like the Bonnet Carré Spillway Control Structure where flow is adjusted or controlled through the opening or closing of gatelike structures versus uncontrolled diversions like the West Bay Sediment Diversion. The West Bay Sediment Diversion has led to increased shoaling in the Pilottown Anchorage and is the only existing Sediment Diversion, it is not a controlled diversion, future diversions must be controlled and impacts related to relative sea level rise and climate change are critical to the future management of the Mississippi River Ship Channel.

Although this position was developed in response to anthropogenic diversions, the negative impact of loss of flow on the navigation channel cannot differentiate between manmade diversions or natural riverine processes. The Big River Coalition supports the USACE's effort to control and limit the loss of freshwater from the uncontrolled diversion known as Neptune Pass.

The Big River Coalition is committed to ensuring the future of navigation on the Mississippi River Ship Channel (MRSC) as one of the nation's fundamental natural resources and true economic powerhouse. The three crevasses on the eastern side of the Ship Channel between Belle Chasse and the Head of Passes listed in descending order or Bohemia Salinity Control Structure (aka Mardi Gras Pass) at Mile 43.7 Above Head of Passes (AHP), Neptune Pass at Mile 43.7 AHP and Fort St. Phillip at Mile 20 AHP remain major concerns of the navigation industry as the loss of flow from the channel stimulates deposition of sediment during high river stages, the USACE had to dredge at Neptune Pass in 2022 for the first time ever. The USACE has had to dredge higher reaches of the Ship Channel over the last 8 years also, the USACE never had to preform channel maintenance above Mile 15 AHP (until above the City of New Orleans) prior to 2022.

The USACE never had to preform channel maintenance dredging above Mile 10.0 AHP prior to 2017 but since then dredge assignments between Mile 13 AHP to Mile 10 AHP are more common. Clearly, the river is actively changing and adjustments to provide critical channel maintenance are required but the crevasses on the eastern side of the Ship Channel below New Orleans represent a major threat to both maritime commerce and our freshwater drinking supply. The crevasses allow stream power to escape during high water periods and the riverine response is to dump sediment as the power of flow is reduced, adding reaches of the Ship Channel that the USACE will eventually have to dredge more frequently. Keeping the stream power in the Ship Channel helps reduce shoaling, scours out the channel, moves

commerce and repels saltwater. These same principles were relevant to the Captain Eads deepening of South Pass over 150 years ago.

The Big River Coalition supports the actions proposed by the USACE to control the flow from the Ship Channel into Neptune Pass, the Coalition must trust the science and engineering of the USACE to find a solution that works for multiple purposes. The reduction in flow at Neptune Pass is critical to safe navigation and the BRC supports the USACE's developed strategy to control the loss of flow at the site of this critical crevasses.

Sincerely,

Sean M. Duffy, Sr.

Sean M. Duffy, Sr.
Executive Director

From:	Al Duvernay
To:	Lahare, Mark H CIV USARMY CEMVN (USA)
Cc:	Al Duvernay
Subject:	[Non-DoD Source] Neptune Pass
Date:	Monday, September 2, 2024 11:11:41 AM

Dear Mr. Lahare,

I am a soft rock geologist, a resident of S La for over 70 yrs, a long time volunteer and a Coastal Advisory Council member at the Coalition to Restore Coastal La. I have written often and at length on various coastal issues and initiatives. This one is important.

The Neptune Pass issue is consequential at many levels. Geologically, it is a flawless model for natural land building deltaic processes - the very processes that built S La. Economically, it demonstrates that we can work with mother nature as opposed to in spite of her to achieve sustainable restoration goals at reduced cost and effort. Politically, it demonstrates that we can work with mother nature as opposed to in spite of her to achieve sustainable restoration goals at reduced cost and effort.

Reconnecting the river to the adjacent wetlands and the subsequent abundant land building is an extremely important tool in our restoration toolbox and one that we strongly champion. This is the process that we attempt to emulate with costly man made diversions.

I'm very pleased that you are considering both navigation and land restoration in your planning for the pass. I'm hopeful that you can leave as much flow in the pass as practical (width & depth), given the navigation and water flow capture issues. Additionally, I would like to see any dredged sediment produced for navigation purposes directed into the pass and/or surrounding ecosystems as opposed to the decades long practice of dumping it off the shelf. Considering our great need for sediment in our restoration efforts, this is an invaluable resource that should be optimized.

Thank you for considering my comments,

Al DuVernay III

Paleontologist, CRCL Volunteer & Advisory Council

[redacted]

[redacted]

From: Will Norman
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass Public Comments
Date: Monday, September 2, 2024 7:08:13 AM
Attachments: image001.png

Dear Mr. Lahare,

I am writing to you as a member of the board of directors of the Coalition to Restore Coastal Louisiana, an advocacy organization whose mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL has been very engaged with the corps and other parties on Neptune Pass. The new delta forming in Quarantine Bay and the surrounding area is extremely important to us, as it represents the sort of reconnection of the Mississippi River to surrounding wetlands that we have been advocating for throughout our 36-year existence. The rapid formation of a new delta is an undeniable success story.

I would like to see Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new EA and plan to install a sill and sediment retention devices. I am grateful that the corps is considering both navigation on the river and the ecosystem adjacent to it.

While the plan is a marked improvement over the previous proposal that would have largely sealed off the pass, I am asking that the corps consider how it can be improved further. For instance, can the notch in the sill be at a lower depth to allow more sediment to enter the pass? Can the SREDs be designed to better reflect the corps mandate to enact nature-based solutions? And can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf?

I congratulate the corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments.

Sincerely,

Will Norman
Strategic Growth Director – Gulf Coast

SWCA Environmental Consultants
1651 Lobdell Ave, Bldg. A
Baton Rouge, LA 70806
P 225.320.5896 | [redacted]

From: Richie Blink
To: Lahare, Mark H CIV USARMY CEMVN (USA)
Subject: [Non-DoD Source] Neptune Pass EA Comment
Date: Tuesday, September 3, 2024 4:10:14 PM

Dear Mississippi River Commission,

I want to thank you for the opportunity to make a public comment on the Army Corps of Engineers Neptune Pass Environmental Assessment.

My name is Richie Blink. I'm a resident of Empire, Louisiana, a town situated just upstream from the proposed closure in Plaquemines Parish, Louisiana. I have formerly served as a Plaquemines Parish Council Member and during that time had the pleasure to serve as the chairman of the Plaquemines Port, Harbor, and Terminal District. I currently operate Delta Discovery, an outdoor education and ecotourism operation bringing several hundred people annually into the Mississippi River Delta to better understand its history, economy, and culture. I'm on the water in this area more than 200 days annually. I do my best to hold a well balanced view of how we can optimize the Birdfoot Delta for people and ecosystems.

In the 1880s the environments that surrounded the river channel were not a second thought. James Buchanan Eads, fresh off his victory of the construction of one of the first bridges across the Mississippi in St. Louis, looked to the delta and a 150 year old navigation conundrum for his next challenge, how to get ships reliably over the bar? He used willow, planks, and locally sourced sediment to concentrate the flow of the river into a distinct channel at South Pass. In the process he created a reliable corridor for traffic. Cargo exports from New Orleans to Europe went from 5000 to 500,000 tonnes annually. This method has worked well and today we manage the shipping channel in much of the same way. The delta building process has been co-opted for navigation and certainty of commerce.

Today, after we've exhausted nearly all the delta has to offer, the river looks like an emaciated vein extending seaward. This vast geologic feature is quickly converting from a lush wetland to a buoyed channel in the gulf. The tragedy in all this is we know what's causing the land loss, we have the technology, and we have the political willpower to make the delta more sustainable. High levels of support exist to seize this opportunity and thankfully this approving body has the power to make for more meaningful restoration.

The Mississippi River Commission has a task that is planetary in scale. The work already accomplished has helped our nation become what it is today. But that great progress has come with great costs, especially for marginalized communities like mine at the end of the river. We've managed the Mississippi purely for certainty of commerce to the point where population decline is evident and land loss is predicted at 55% of the total land area of Plaquemines Parish. Much of the damage is caused by the way humanity chooses to manage the shipping channel of the Mississippi River.

At Neptune Pass a tremendous opportunity exists to let nature and the economy coexist in the most thoughtful and robust ways but the EA does not go far enough to optimize the opportunity to the fullest. In the spirit of a recent memo to incorporate nature-based solutions in civil works projects, I respectfully implore the Corps to further investigate efficiencies, optimization, and community input to make the most of this opportunity at Neptune Pass.

Neptune Pass has been flowing at high capacities since at least 2019. Shipping has not ground to a halt and two way traffic is still in play. The purpose and need does not match the proposed actions. Neptune's development is not the highest of emergencies, rather an opportunity to thoughtfully investigate a complimentary way of managing the Mississippi River Delta. The methods of the past, many of which were developed in the 1870s during the industrial revolution, are rooted in ecocide and have led unintended, yet real, impacts to communities along the delta. The justification and authorization of the proposed work at Neptune Pass is based on outdated EIS created in 1974 during the Gerald Ford administration. Humanity has learned so much about ecosystem management, risk reduction, and how to plan for doing more than one thing at a time since these management plans were developed.

Thankfully two major studies are underway to help manage the river for a multitude of tasks, commerce, recreation, ecosystem enhancement are all being considered. The Lower Mississippi River Comprehensive Management Study and the Mississippi River Delta Transition Initiative both investigate the possibility of a more holistically managed

Mississippi River. I fear that the proposed closure at Neptune flies in the face of the spirit of these two studies. The proposed actions at Neptune should not proceed before these studies are complete, or we risk cementing permanence in an impermanent delta. Humanity is on the eve finding new ways to help manage the Mississippi, a closer look at this proposed closure is in order.

The Mississippi River Commission's website hints at a noble mission and says "to lead sustainable management and development of water related resources for the nation's benefit and the people's well being." From my humble observation point within the delta, we will be failing the mission without finding a more nuanced way to have commerce and wetlands coexist at this location. I have tried my best to engage with the Corps to model methods, features, and tactics that could achieve better outcomes, but this isn't afforded to the public.

Opening up some Corps decisions to meaningful public input on the front end will undoubtedly lead to better outcomes, cost savings, and greater sustainability for the delta, as well as the federal shipping channel. Local opinions should be included early and often. Yet the process which this closure has been rolled out is, what I would describe as, antidemocratic and anti science based. It's quite frustrating seeing the barge on site collecting geotechnical borings but not having even the simplest of community meetings to discuss potential closure options, much less reach out for input that could help to make a better outcome.

The computer modeling used to justify this EA has not been publicly available. I have not found it on the Corps website, yet the end of the public comment period is looming. This is a shipping channel maintained by a public entity, not a military or trade secret. Information around the decision making process should be readily available to the public. Cost estimates have not been shared but may approach or exceed $50M US dollars.

The information and engagement process surrounding this EA has been intentionally obscured and made as difficult as possible. In seeking information, many emails contained redacted content. Some emails were almost entirely redacted. The requested computer modeling report to justify the potential closure was sent to a local NGO sixteen business hours ahead of the comment period closing. These actions are cause for alarm and concern. Even a basic extension of the comment period was denied by the Corps for what is one of the biggest ecosystem restoration opportunities in the United States right now. The decision of how we optimize Neptune Pass, or not, will be a marker in time where humanity is, or isn't, on balancing the important task of heading off the worst of climate change impacts in the US. Will the agency find cover behind a mission and authorization, or figure out how to do the right thing while still carrying out the designated tasks? There is an appearance of the "let us try" mentality at the corps being replaced with a lethargy around the willingness to address these major ecological and climate challenges from within the agency.

At this rate, until the water laps at the doors of the mansions of St. Charles Avenue and beyond only then will we try to optimize the Mississippi River for what it can do for both navigation and ecosystems, in the meantime my community will continue to be collateral damage, not for a system without technological advancement, or good ideas, but for simply not trying hard enough -that is the tragedy. We have to walk and chew gum at the same time, all of us.

The irony and injustice of all this is that the people in charge of creating certainty of commerce at this location allowed a minor distributary to develop into the tenth largest river on the continent. Now these same folks get to decide which methods are used to "fix" it. All this while making input by the public as difficult as legally possible. I've been struggling to find a sense of understanding and a way to express this without being off-putting. There is great hubris in this mindset at the Corps. It makes me fear that humans will not be capable of dealing with some of our greatest environmental and social challenges moving forward. I hope I'm wrong here and the Corps works with folks on the ground to try to model some more beneficial outcomes. There are attitudes that the river is static, that it need not be watched, that continuing education around conditions on the ground/water need not apply, and we can overwhelm problems with money and rock. Until these attitudes shift we will continue to be a reactive people. Hopefully this can all change. Intentional collaboration can lead to better outcomes. We can't afford not to do it.

I'm thankful the Corps is considering leaving Neptune at least partially open. It seems physics, the models, and the river have decided against the first proposal which called for near complete closure. I applaud the decision to "allow" for a more natural connection here.

The new delta in Quarantine Bay, built by Neptune Pass, is likely the largest new delta in North America and can

continue to grow if nothing rash is carried out. Scientists estimate that close to 3000 acres of sub and intertidal flats have formed here with a distinct distributary pattern becoming obvious. The amount of material deposited here has been confirmed by comparing previous oyster reef surveys with recent detailed bathymetric surveys. Something on the order of two thirds of the material in the area has been deposited by the river and not by simple erosion of the pass. This is not accounting for material diverted into Bay Denesse and fine sediments traveling far outside of the survey area. This new area of growth in Quarantine Bay saw filling of several feet. The new delta, an area of vast flats and distinct areas of water movement which will likely develop into passes, measures on the order of ten square miles. The proposed actions within the EA will rob the people and ecosystem of this new delta by making drastic impacts to existing wetlands.

To minimize environmental consequences, the design, installation, and alignment of sediment retention enhancement devices (SREDs) needs to be further refined. The proposed SREDs need to be installed with an eye towards the existing distributary network. In short, working with the delta we have. As modeled, these SREDs seem to be doing one thing, and that's stabilizing the channel. That is important but we need to try a little harder to work with the bigger picture of what's going on within Neptune Pass and the new Quarantine Bay Delta. We can achieve much improved wetland growth while spending the same or less public dollars.

SREDs containing rock cores are a step toward permanence that should not be taken. Instead, it may be advisable to use mined sediment from the main river channel, to help an already growing delta. Doing this can achieve joint goals of stabilizing the shipping channel and encouraging wetland growth. In addition to avoiding SRED placement of a permanent and misaligned nature, some SRED placement is slated directly on top of existing wetlands and it appears the modeling was using imagery from 2019, before a significant land growth push in Quarantine Bay.

Just on the upstream side of the proposed terrace field sits 126 acres of freshwater marsh and flats colonized by submerged aquatic vegetation. This area will be directly impacted by construction activities. Secondary impacts to the prodelta will come in the form of flow reductions and reductions of sediment supplies. These wetlands are due consideration under the Clean Water Act Section 404. Besides ecological impacts, charter guides, waterfowl guides, and ecotourism operations that depend on these wetlands will be impacted during construction activities and after the deletion of these wetlands. Additional wetland impacts can be found on the downstream side of Neptune where vegetation is colonizing new bars and flats. Marsh grasses are spreading from the former shoreline and colonizing these new shallow areas.

I urge the reviewing body to consider these new wetlands and the positive transformation of ecological health by thoughtfully adjusting the SRED alignment to ensure the longevity of these existing wetlands. The existence of these freshwater marshes and the plans to destroy them by placing SREDs at that location may invalidate the finding of no significant impact or FONSI.

The proposed actions are tantamount to the deletion of a new delta that could develop into a landform comparable to the Cubit's Gap delta complex, a 35,000 acre delta lobe that formed over a century's time. While river conditions are not the same, great potential for wetland creation exists at this location and could be used to offset unavoidable impacts elsewhere in the delta many of which have been caused by managing the river primarily for navigation interests.

An additional alternative of injecting sediment near the mouth of Neptune Pass would avoid wetland impacts from SRED construction. This softer approach may be less expensive than transporting several hundred barges of stones to this location. The prospect of using adaptive management and building a new delta is a tactic that should be embraced by the Corps and something that has had success for other shoreline stabilization projects along Southwest Pass. Working with the existing distributary network could have a higher level of success toward these ends. The receiving area is already quite shallow and would fill quickly with Neptune's currents helping to spread sediment where it needs to be.

There may be some bureaucratic impediments to working further from the channel toward these ends. I empathize with folks at the Corps about those hurdles and recognize the need to remove those limitations of holistically managing this river through this segment. The water does not stop flowing along arbitrary lines and we need to manage it as such.

The notch in the proposed closure needs to be deeper. Already the Corps has thrown dozens of barges of rocks into

this location which was brought up from -95’ to -35’. We need to turn our thinking on end for this. Capturing as much bed load sediment as possible is a tactic that can lower costs downriver. This needs to be modeled in many configurations with the goal of maximizing sediment capture. This will help relieve the dredging burden downstream. The current rock wall is serving as a sediment excluder. This high wall could be thoughtfully modified to optimize the sediment to water ratio.

Going further, features on the bottom of the river channel that train sediment toward the confluence of Neptune and the Mississippi could be investigated and installed well below the draft of traffic. We need not have limits on our imagination when trying to get as much as we can from this vital waterway.

Already equipment and practices are underway in the delta that can artificially increase the sediment load within Neptune Pass. Designating the confluence of the Mississippi and Neptune a hopper dredge disposal area (HDDA) could lead to more sediment entering the system. I was shocked to see this was not utilized when some light dredging was done just downstream of Neptune. Designating a HDDA at this location could be a good management of the river. The river is constantly changing and we must adjust our practices to meet it where it is. Keeping the confluence of Neptune and the Mississippi navigable enough to allow hopper dredges inside the pass should be investigated and taken seriously.

For these reasons I do not believe this EA goes far enough in maximizing the opportunity that Neptune Pass has created. Managing the river for a longer time horizon using natural solutions will produce the same economic certainty for shippers as well as lead to a more robust delta around the shipping channel. These are moving targets on an ever changing coast. A more sustainable delta is possible and I implore you to consider improvements to the design and operations that could take place at Neptune Pass.

I would like to ask the reviewer and commission, if this plan to close Neptune Pass were in your town, would you be trying to optimize the design to the fullest? Would you be working to authentically, and deeply, engage the community to garner insights and make the most of the situation? So far, I do not believe that is what the public is getting from this process. We have the chance to create an outcome that is a lasting testament to forethought, inclusion, and optimization. I hope we can get there before it’s too late.

With gratitude,
-Richie Blink

--
Richie Blink

Deltadiscoverytours.com

[redacted]

Dear Mr. Lahare,

I am writing to you as an owner of an ecotour company, The Great Delta Tours, that operates in southeast Louisiana. I am also a member of the Coastal Advisory Council of the Coalition to Restore Coastal Louisiana(CRCL).

CRCL has been very engaged with the U.S. Army Corps of Engineers(Corps) and other parties on Neptune Pass. As a member of the CRCL Coastal Advisory Committee, I have been briefed and invited on site visits to the project area. The new delta forming in Quarantine Bay and the surrounding area represents the sort of reconnection of the Mississippi River to surrounding wetlands that the State, the Corps and environmentalists have been advocating for since Louisiana's first Master Plan completed in 2007.

I support having Neptune Pass left open as much as possible to continue land building while also ensuring safe navigation. I am generally very pleased with the new Environmental Assessment(EA) and Plan to install a sill and sediment retention devices. I am grateful that the Corps is considering both navigation on the river and the ecosystem adjacent to it.

While the plan is a marked improvement over the previous proposal that would have largely sealed off the pass, I am asking that the Corps consider how it can be improved further. For instance, can the notch in the sill be at a lower depth to allow more sediment to enter the pass? Can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf?

I congratulate the Corps on the plans outlined in the EA and am grateful for the opportunity to submit my comments.

Sincerely,

Barbara

Barbara K. Johnson
President and CEO
The Great Delta Tours
www.thegreatdeltatours.com

From:	Lahare, Mark H CIV USARMY CEMVN (USA)
To:	Lahare, Mark H CIV USARMY CEMVN (USA)
Subject:	RE: [Non-DoD Source] Re: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana
Date:	Tuesday, September 3, 2024 7:36:38 AM

Mark Henry Lahare
Coastal Compliance
Environmental Compliance Branch
U.S. Army Corps of Engineers – New Orleans District
(504) 862-1344
<mark.h.lahare@usace.army.mil>

From: Craig Gothreaux - NOAA Federal <craig.gothreaux@noaa.gov>
Sent: Thursday, August 22, 2024 9:53 AM
To: Lahare, Mark H CIV USARMY CEMVN (USA) <Mark.H.Lahare@usace.army.mil>
Cc: _NMFS ser HCDconsultations <nmfs.ser.hcdconsultations@noaa.gov>
Subject: [Non-DoD Source] Re: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana

Mark,

The NMFS Habitat Conservation Division has reviewed draft Environmental Assessment (EA) #589 and the draft Finding of No Significant Impact (FONSI), and does not object to the proposed actions.

Thank you for your coordination,
Craig

On Fri, Aug 2, 2024 at 7:59 AM Rusty Swafford - NOAA Federal <rusty.swafford@noaa.gov> wrote:

> ---------- Forwarded message ---------
> From: **Lahare, Mark H CIV USARMY CEMVN (USA)** <Mark.H.Lahare@usace.army.mil>
> Date: Fri, Aug 2, 2024 at 7:33 AM
> Subject: Draft EA #589 and FONSI - Neptune Pass Rock Closure, Plaquemines Parish, Louisiana
> To: Swafford, Rusty <rusty.swafford@noaa.gov>
>
> Dear Mr. Swafford:

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South, has prepared the attached draft Environmental Assessment (EA) #589 to evaluate the potential impacts associated with constructing flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana. In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed further in this revised draft EA.

Please reference the letter addressed to your office attached to this e-mail for additional project and contact information.

Public comments for the draft EA and FONSI will be accepted through **August 31, 2024**.

Respectfully,

-Mark Lahare

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Mark Henry Lahare

Coastal Compliance

U.S. Army Corps of Engineers - New Orleans District

(504) 862-1344

<mark.h.lahare@usace.army.mil>

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Rusty Swafford
Gulf of Mexico Branch Chief
Southeast Region, Habitat Conservation Division
NOAA Fisheries
U.S. Department of Commerce
4700 Av U, Galveston, TX 77551
Office: (409) 766-3699

FAX: (409) 766-3575
Rusty.Swafford@noaa.gov

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Craig Gothreaux
Fishery Biologist
Southeast Region, Habitat Conservation Division
NOAA Fisheries
5757 Corporate Blvd., Suite 375
Baton Rouge, LA 70808
Office: (601) 890-1275
Craig.Gothreaux@noaa.gov

Web	*www.nmfs.noaa.gov*
Facebook	*www.facebook.com/usnoaafisheriesgov*
Twitter	*www.twitter.com/noaafisheries*
YouTube	*www.youtube.com/usnoaafisheriesgov*

September 3, 2024

Mr. Mark Lahare
United States Army Corps of Engineers
Regional Planning and Environment Division South
New Orleans Environmental Branch
7400 Leake Avenue
New Orleans, Louisiana 70118-3651

Re: NEPA-EA #589

Mr. Lahare,

I am writing on behalf of the Coalition to Restore Coastal Louisiana (CRCL), the first statewide nonprofit organization dedicated to confronting coastal land loss in Louisiana. We represent a unique mix of businesses, local governments, industries, scientific communities, national and local conservation groups, hunters, anglers and a broad spectrum of concerned residents. Our mission is to unite people in action to achieve a thriving, sustainable Louisiana coast for all.

CRCL is encouraged to see the Army Corps of Engineers taking a broader assessment of the ecological benefits produced by Neptune Pass in Environmental Assessment #589 (EA #589) released on August 2, 2024.

CRCL considers the opening of Neptune Pass and resulting formation of a new delta in the outfall area one of the most important natural developments on the lower river in decades. The river is forming new land the way it did for thousands of years. In a state better known for having about 2,000 square miles of wetlands disappear in less than a century, this is extraordinary.

These new wetlands constitute additional hurricane protection for dozens of communities in Plaquemines Parish, St. Bernard Parish, Orleans Parish and beyond. They are also providing rich habitat for wildlife. It is notable that much of the shrimping and charter fishing in this part of the state has moved to the Neptune Pass side of the river.

Neptune Pass should be left open as much as possible for as long as possible to maximize all these benefits.

3801 Canal Street, Suite 400
New Orleans, LA 70119
CRCL.org

General Comments

The Neptune Pass environmental assessment seems to seek to balance the need for navigation on the Mississippi River with the need for a healthy ecosystem outside the levees by controlling the flow of water into the pass but not attempting to close it. In this way, the corps is allowing the river to continue to build land in Quarantine Bay, Bay Denesse and the surrounding area. That is the basic approach that CRCL and its supporters have wanted. Therefore, we consider the EA a qualified win for all who live, work, hunt and fish in southeast Louisiana. Furthermore, we appreciate the innovative approach to utilizing SREDs to reduce the hydrologic gradient between the river and the receiving wetlands.

At the same, we question whether it is necessary to restrict flow to the extent proposed. The EA does not provide data or modeling to fully explain and justify the proposed depth of the sill and notch. We would like to see the scientific analysis that informs the proposed actions. We would also like to see evaluation of an alternative using an inlet structure and SREDs as in the currently preferred alternative but with a lower sill and/or notch to provide for more sediment transport through the pass.

We question whether it is necessary or desirable to engineer the SREDs so extensively. We would like to see the scientific analysis that informed the proposed structures. We would like to see an evaluation of a more natural alternative that would allow the SREDs to adapt and change with the environment. We would also like to see consideration of building SREDs from sediment dredged from the river, rather than from Quarantine Bay.

We disagree with the finding that the project will have no significant impact on the environment. Constricting flow through Neptune Pass will undermine ongoing land building in Quarantine Bay, and sourcing sediment for SREDs from the receiving zone could eliminate land-building benefits that have been realized from the pass over the past few years by transforming new land and wetlands and shallow-water SAV habitat into open water. We recommend that the corps undertake a full EIS in order to fully assess modifications and additional actions that could lead to additional land building such as use of dredged material from the river to augment the natural processes that are occurring.

Specific Comments

While the proposed approach represents a considerable improvement from the initial proposal to seal off the pass, we believe the plan can be made better still. Therefore, we urge the corps to consider the following:

- a deeper notch in the sill at the opening of the pass, to capture heavier particles of sediment at the bottom of the river channel.

- a deeper sill to allow for more flow from the river into the pass, while also ensuring safe navigation on the river.

- an incremental approach whereby the notch and/or sill could be raised over time should monitoring data indicate that necessary.

- a redesign of the SREDs without rock and geotextile so that they can adapt and change with the environment, similar to the design of the SREDs that were installed at the West Bay Sediment Diversion. We believe this redesign would reflect the corps' request to embrace nature-based solutions in civil works projects. A corps memorandum on the request states: "*In planning and developing CW projects, USACE will present all possible solutions, including the use of NBS, clearly and transparently to inform the recommendation for the final project authorized by Congress for federal action*." We are hopeful that this design would also prevent costly overengineering so that resources could be invested instead in efforts to maximize the land-building potential of the pass.

- use of sediment from the river to build the SREDs. We note the plan calls for locally sourced sediments. We are concerned that dredging from Quarantine Bay could undermine the significant land-building process that has occurred in recent years.

- design of SREDs informed by up-to-date information about the new lands and wetlands that have been created by the deposition of sediment into Quarantine Bay and other areas in the outflow area of the pass. We are concerned that the SREDs must add to, and not diminish, past and future land building in the receiving zone.

- community engagement in the SRED design, construction and adaptive management.

We note that the corps has been dredging just downriver from Neptune Pass. We ask that the corps consider whether that dredged material can be used to accelerate the land-building potential of Neptune Pass, by transporting the sediment to the pass and depositing it on the outfall side of the sill. That would allow water flowing through the pass to direct that sediment into Quarantine Bay and surrounding areas, accelerating land building in the outfall. We believe this relatively low-tech and low-cost strategy could significantly increase the rate at which healthy wetlands are forming, and the expense could possibly be defrayed if the work is considered mitigation for other work conducted along our coast. We also believe it would reflect the corps' request to "*consider water resources problems holistically and consider comprehensive solutions that may include alternatives beyond USACE's missions.*"

We also would like to know how the work proposed in the EA would affect the Ostrica Lock, Bayou Lamoque and other points where the river is connected to wetlands downriver from New Orleans.

I appreciate the opportunity to comment on this plan. If you have any questions, please feel free to email me at ethan.melancon@crcl.org.

Thank you,

Ethan J. Melancon, MPA
Advocacy Director

Responses to Agency and Public Comments

Draft EA #589 and the associated FONSI were submitted for agency and public review. The 30-day NEPA public comment period began Friday August 2, 2024, and while officially ending on Saturday August 31, 2024, USACE recognized that this period coincided with Labor Day Weekend and a designated Federal Holiday on Monday September 2, 2024. As such, USACE continued to accept comments provided either electronically or postmarked via U.S. Postal Mail through Tuesday, September 3, 2024 (total comment period of 33-days).

Joey Breaux
Assistant Commissioner
Louisiana Department of Agriculture and Forestry / Office of Soil and Water Conservation
Letter dated August 13, 2022
Reference Appendix B, p. 2

1. "The LDAF/Office of Soil & Water Conservation has reviewed the attached Environmental Assessment (EA) #589 regarding the proposed flow control structures in Neptune Pass and in Quarantine Bay on the left descending bank of the Mississippi River, in Plaquemines Parish, LA, approximately 11 miles northwest of Venice, LA and has no objection."

Response 1 – Acknowledged.

Ethan J. Melancon
Advocacy Director
The Coalition to Restore Coastal Louisiana
Letter dated August 16, 2024
Reference Appendix B, pp. 3-4

1. "…CRCL would like to formally request the following additional documents and information mentioned by the EA #589 for further assessment:

    - All USACE modeling reports related to the proposed action for Neptune Pass, including but not limited to the 2023 draft model report mentioned in the references.
    - Any cost estimates for the Sediment Retention Enhancement Devices (SREDs) mentioned in EA #589.
    - Information relating to the bidding process for the river-facing structure and the SREDs, including information about whether these projects will be treated as two separate projects or one.
    - Any information relating to the current designs and design stages of the SREDs.

Response 1 - In a letter dated August 29, 2022, USACE responded to CRCL addressing all comments/requests for additional information as well as and providing the November 2023 Neptune Pass Model Report as an enclosure.

2. "In addition to the list above, CRCL is formally requesting an extension to the public comment period."

Response 2 - Regarding CRCL's request for a public comment period extension, USACE did not extend the public comment period for draft EA #589. As stated within the USACE response

letter, “With the enclosed report and information provided in this letter, we believe that your organization and the stakeholders you represent will be able to both review and provide a fully informed position on the proposed project within the remaining public comment period.”

Marissa Jimenez
Environmental Scientist Manager
Louisiana Department of Environmental Quality - Office of the Secretary
Letter dated August 28, 2024
Reference Appendix B, pp. 5-6

1. “The Louisiana Department of Environmental Quality (LDEQ) has received your request for comments on the above referenced project. After reviewing your request, the Department has no objections based on the information provided in your submittal.”

Response 1 – Acknowledged.

The following three comments were received by e-mail from members of the board of directors for the Coalition to Restore Coastal Louisiana. The names and dates of the commenters are listed below followed by the three comments and responses:

John Morello
Email received on August 29, 2024
Reference Appendix B, p. 7

Sarah Giles
Email received on August 29, 2024
Reference Appendix B, p. 8

Kristen Sonnier
Email received on August 29, 2024
Reference Appendix B, p. 9

Tina Freeman
Email received on August 29, 2024
Reference Appendix B, p. 10

John D. Ross, Jr.
Email received on August 30, 2024
Reference Appendix B, pp. 11-12

Stephen Chustz
Email received on August 30, 2024
Reference Appendix B, pp. 13-14

Sam Miles
Vice President, Corporate Development
International-MATEX Tank Terminals
Email received on August 30, 2024
Reference Appendix B, p. 16

Robert Gardiner
Email received on August 30, 2024
Reference Appendix B, p. 17

Robert Gorman
Email received on August 31, 2024
Reference Appendix B, p. 23

Marie Gould
Email received on August 31, 2024
Reference Appendix B, p. 24

Al DuVernay III
Email received on September 2, 2024
Reference Appendix B, pp. 42-43

Will Norman
Strategic Growth Director – Gulf Coast
SWCA Environmental Consultants
Email received on September 2, 2024
Reference Appendix B, p. 44

Barbara K. Johnston
President and CEO
The Great Delta Tours
Email (attached letter) received on September 3, 2024
Reference Appendix B, p. 49

1. "…can the notch in the sill be at a lower depth to allow more sediment to enter the pass?"

Response 1 – The sediment entering the pass is primarily fine sediment (silt and clay). Silt and clay are well-mixed in the water-column, so the elevation of the sill will not greatly influence the amount of silt and clay diverted. The sand-sized sediment that is being diverted at Neptune Pass is mostly suspended fine sand. The small size of these sand grains, in conjunction with the significant turbulence in the deep part of the river (the river is deep at the conjunction with Neptune Pass), mean that these sands are relatively well-mixed in the water column (there is always a vertical gradient of sand concentration, but it is milder at this location than it would be if the sand were coarser or the flow were less energetic). This means that the elevation of the sill is not as relevant to the concentration of sand diverted as it would be for a crevasse (or diversion) situated on top of a lateral bar. In addition, the diversion to Neptune Pass accelerates the flow (i.e. the streamlines are converging) so the diversion captures flow from the river from deeper in the water column than the sill itself. All of these elements suggest that the elevation of the sill will not significantly alter the total concentration of the sediment being diverted. In any event, the sill elevation is integral to the design of the sill, as the elevation is the means whereby flow is regulated. The primary purpose of both the sill and the SREDS is to regulate flow. The reduction in the water discharge through Neptune Pass plays a larger role in the reduction of the *mass* of diverted sediment than does the sill elevation. This is because the mass of sediment is diverted is a function of both concentration and water discharge (mass = flow times concentration times time).

2. “Can the SREDs be designed to better reflect the corps mandate to enact nature-based solutions?”

Response 2 – The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion. However, this does not mean that the SREDS are not a “nature-based” solution. On the contrary, the SREDS are designed to create recirculation and quiescent conditions (in the lee of the SREDS) to induce deposition and accumulation of sediment, especially of silts and clays (which are the dominant sediments transported through Neptune Pass). Without the presence of the SREDS, these silts and clays tend to deposit in thin, diffuse layers offshore, and are subject to wind-wave resuspension. The induced focusing of deposition associated with the SREDS is intended to accelerate land building (i.e. the creation of emergent landforms that can vegetate).

3. “And can sediment dredged downriver from the pass be deposited into the pass so that it can be funneled into Quarantine Bay instead of dumped off the continental shelf?”

Response 3 – The justification for this project is to protect navigation in the Mississippi River by controlling and limiting the discharge through Neptune Pass. Adding sand to Neptune Pass could theoretically mitigate the flow of the pass over time (as the crevasse-delta builds), but this would be an ancillary benefit that cannot be quantified without significant uncertainty. Hence, it is not appropriate to include it as part of this project. In addition, it is not accurate to say that the sediment in the river is “dumped off the continental shelf”. Most of the sand transported in the river ultimately settles in the river and is either stored downstream (which has been filling for decades), dredged (most of the dredged material is now used to build land) or diverted through existing crevasses (often resulting in new land). A significant portion of the silts and clays are also retained locally in existing crevasses, although silts and clays also exit the river in multiple locations (including Southwest Pass). Please see the following reference:

Allison, M.A., Demas, C.R., Ebersole, B.A., Kleiss, B.A., Little, C.D., Meselhe, E.A., Powell, N.J., Pratt, T.C., and Vosburg, B.M., 2012. A water and sediment budget for the lower Mississippi-Atchafalaya River in flood years 2008-2010: implications for sediment discharge to the oceans and coastal restoration in Louisiana. Journal of Hydrology 432/3:84-97

Restore the Mississippi River Delta (multiple signatories)
Letter dated August 30, 2024
Reference Appendix B, pp. 18-20

1. “The outlet structures would consist of approximately 20 V-shaped Sediment Retention Enhancement Devices (SREDs) in Quarantine Bay to help reduce the velocity of water coming through the stone sill, reducing the hydrologic head differential. While we understand the focus of this EA is reduce water flow through the pass, we would like an opportunity to discuss the design and placement of the SREDs that could create multiple benefits for river navigation and the ecosystem.

   Additionally, we appreciate the inclusion of nature-based solutions in the project concept but would like to further discuss the less natural use of rock and geotextiles in the building design. We would appreciate the opportunity to share the best practices of several partners

who have constructed terracing projects in nearly this exact footprint with several years of monitoring conducted which we believe is relevant to this project and project footprint."

Response 1 – USACE acknowledges and concurs with the benefits derived from and ongoing need to "…share the best practices of several who have constructed terracing projects in nearly this exact footprint with several years of monitoring conducted which we believe is relevant to this project and project footprint." As noted in your letter, USACE previously met with members of your organization in June 2022 and again in January 2023. Requests for additional meetings with USACE staff to discuss design and progress of the project may be submitted at any time through our Public Affairs Office at askthecorps@usace.army.mil.

2. "The rapid formation of Neptune Pass, as well recent changes in flow through the Fort St. Philip crevasses, indicates that the dynamics in the lowermost river are changing and this change is likely to continue as sea level continues to rise and the delta continues to subside. Given the expansion of Neptune Pass is likely a result of some of those long-term changes in dynamics, has the Corps considered impact that a partial closure of Neptune Pass will increase pressure somewhere else in the vicinity, increasing flow through another pass."

Response 2 – Yes. We recognize that restricting the flow in any one of the passes will result in higher river stages, which in turn will increase the head difference across the East Bank (i.e. water surface slope between the river and southeast Breton Sound). These considerations are being investigated more systematically in other studies. The justification for the restriction of flow in Neptune Pass arises from the Navigation Mission, and this effort is focused on the mitigation of that concern. However, the limited objectives of the flow restrictions in this effort, together with the use of downstream control to mitigate the flow, are both informed by the concern voiced in this comment. That is, we are trying to achieve the navigation objectives with the least reduction in flow possible, in part to limit the increase in pressure on other passes or on other locations along the East Bank.

3. "Finally, we have questions related to the funding and timing of construction, which were not detailed as part of the assessment. Again, as a minimal standard, this information should be shared with the stakeholders of this area and the public who use this area frequently."

Response 3 – Acknowledged. Cost estimates of the proposed project features are not releasable as it is Source Selection Information in accordance with FAR 2.101 and may impact a future acquisition. The current plan, which is subject to change, is to separate the two features (inlet structure and outlet structures (SREDs) into two separate contract actions. No additional information regarding timing of construction is releasable as it is Source Selection Information under FAR 2.101 and may impact a future acquisition.

4. "We are disappointed in the release of the draft environmental assessment for the proposed Neptune Pass Rock Closure for a public review; in fact, we cannot say for certain when the official comment period began. Information was shared with some, but not all, via USPS, as well as by word of mouth prior to a delayed posting on the "News" portion of the USACE NOLA website. A best practice would have been to share this information with all those that submitted comments on the 2022 EA at a minimum electronically."

Response 4 – Do not concur. Per the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Implementation Regulations (40 CFR parts 1500 – 1508), compliance with laws associated with public involvement for an EA was accomplished upon the 30-day public and agency review of draft EA #589 and associated FONSI. Additionally, during

the public review period for draft EA #589, public comments were also solicited for the CWA Section 404(b)(1) Public Notice. It should be noted that both the 30-day NEPA public comment period and CWA Section 404(b)(1) Public Notice comment period began Friday August 2, 2024, and while officially ending on Saturday August 31, 2024, USACE recognized that this period coincided with Labor Day Weekend and a designated Federal Holiday on Monday September 2, 2024. As such, USACE continued to accept comments provided either electronically or postmarked via U.S. Postal Mail through Tuesday, September 3, 2024. USACE obligations pertaining to public involvement have been satisfied.

5. "As a next step, we would appreciate the opportunity to further discuss in person the solutions proposed for the Quarantine Bay area."

Response 5 – Reference Response 1.

Kristi Trail, P.E.
Executive Director
Pontchartrain Conservancy
Letter dated August 30, 2024
Reference Appendix B, pp. 21-22

1. "We recognize the current SREDs configuration in the EA is approximate; however, we urge USACE to consider SREDs designs and geometries that are congruent with natural deltaic mechanics to maximize land building."

Response 1 – The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion. However, this does not mean that the SREDS are not designed to build land. On the contrary, the SREDS are designed to create recirculation and quiescent conditions (in the lee of the SREDS) to induce deposition and accumulation of sediment, especially of silts and clays (which are the dominant sediments transported through Neptune Pass). Without the presence of the SREDS, these silts and clays tend to deposit in thin, diffuse layers offshore, and are subject to wind-wave resuspension. The induced focusing of deposition associated with the SREDS is intended to accelerate land building (i.e. the creation of emergent landforms that can vegetate).

2. "As sediment flows into the outfall areas adjacent to Neptune Pass and ultimately creates a new delta system in the coming years, our scientists will continue to monitor the area and gather data on this important waterway. We truly value our relationship with USACE and as we move forward, we hope to maintain an open dialogue and share information with your team regarding Neptune Pass."

Response 2 – USACE acknowledges and concurs with the benefits derived from and ongoing need to "…maintain an open dialogue and share information…regarding Neptune Pass." Requests for additional meetings with USACE staff to discuss design and progress of the project may be submitted at any time through our Public Affairs Office at askthecorps@usace.army.mil.

Amanda R. Moore
Senior Director, Gulf Program
National Wildlife Federation
Letter dated August 31, 2024
Reference Appendix B, pp. 25-28

1. "It is not clear how reduction in flow through Neptune Pass may increase pressure at other outlets during high river events. The proposed SREDs, while innovative, appear to be overengineered for the needs of the project, relying on stones and geotextile, and driving up project cost. It is also unclear from the EA how modeling, planning, and design has informed the placement, shape, and configuration of the proposed SREDs…."

Response 1 – We recognize that restricting the flow in any one of the passes will result in higher river stages, which in turn will increase the head difference across the East Bank (i.e. water surface slope between the river and southeast Breton Sound). These considerations are being investigated more systematically in other studies. The justification for the restriction of flow in Neptune Pass arises from the Navigation Mission, and this effort is focused on the mitigation of that concern. However, the limited objectives of the flow restrictions in this effort, together with the use of downstream control to mitigate the flow, are both informed by the concern voiced in this comment. That is, we are trying to achieve the navigation objectives with the least reduction in flow possible, in part to limit the increase in pressure on other passes or on other locations along the East Bank.

The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion. However, this does not mean that the SREDS are not designed to build land. On the contrary, the SREDS are designed to create recirculation and quiescent conditions (in the lee of the SREDS) to induce deposition and accumulation of sediment, especially of silts and clays (which are the dominant sediments transported through Neptune Pass). Without the presence of the SREDS, these silts and clays tend to deposit in thin, diffuse layers offshore, and are subject to wind-wave resuspension. The induced focusing of deposition associated with the SREDS is intended to accelerate land building (i.e. the creation of emergent landforms that can vegetate).

2. "Critically, we require, and formally request, that the Corps make all the modeling and data that supports the planning and design of the inlet and outlet features outlined in the EA available to the public as quickly as is practicable as required by law.

Response 2 – Acknowledged. As part of the Final EA #589, an Appendix will be included containing the November 2023 Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro Morphodynamics and Control Structure, prepared by the USACE, Engineering Division, Hydrology, Hydraulics, and Coastal Engineering Branch and Lower Mississippi River and Tributaries Engineering Branch. An electronic copy of the Final EA #589 associated FONSI, and the aforementioned Appendix will be uploaded to the CEMVN District web page at: https://www.mvn.usace.army.mil/Missions/Environmental/NEPA-Compliance-Documents/Civil-Works-Projects/2024-Civil-Works/.

3. “The Corps’ release of the 2024 EA was not adequately communicated to the public, and the actual deadline for submitting public comments remains unclear. For example, letters were sent out to some that provided a due date for the comments that conflicts with the due date published on the Corps website. In addition, the 2024 EA was not made available on the Corps’ website until August 7, 2024, providing the public with just 25 days to review and submit comments by what we understand to be the August 31, 2024 deadline. This is well-short of the typical 30-day public comment period that already provides a very limited amount of time to provide comments.”

Response 3 – Do not concur. Per the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Implementation Regulations (40 CFR parts 1500 – 1508), compliance with laws associated with public involvement for an EA was accomplished upon the 30-day public and agency review of draft EA #589 and associated FONSI. Additionally, during the public review period for draft EA #589, public comments were also solicited for the CWA Section 404(b)(1) Public Notice. It should be noted that both the 30-day NEPA public comment period and CWA Section 404(b)(1) Public Notice comment period began Friday August 2, 2024, and while officially ending on Saturday August 31, 2024, USACE recognized that this period coincided with Labor Day Weekend and a designated Federal Holiday on Monday September 2, 2024. As such, USACE continued to accept comments provided either electronically or postmarked via U.S. Postal Mail through Tuesday, September 3, 2024 (total comment period of 33-days). USACE obligations pertaining to public involvement have been satisfied.

4. “NWF is currently funding additional work in the area to continue to monitor the development of land in Bay Denesse and the large subaqueous delta in Quarantine Bay. We will share that data as it becomes available and would like the opportunity to further discuss the design, configuration and placement of the SREDs.”

Response 4 – USACE acknowledges and concurs with the request to “…further discuss the design, configuration and placement of the SREDs.” Requests for additional meetings with USACE staff to discuss design and progress of the project may be submitted at any time through our Public Affairs Office at asktheccorps@usace.army.mil.

5. **“The EA provides a clear target for the flow reduction through Neptune Pass, but not how that target flow was derived.** The purpose of the structures proposed at Neptune Pass is to eliminate a navigational hazard in the Mississippi River. While Neptune Pass has existed for decades, the 2019 Mississippi River flood saw the pass expand up to 15% to 17% of the Mississippi River’s flow. The EA proposes to use an inlet and outlet features to reduce the flow to 6% of the Mississippi River’s flow. This is an improvement over the 2022 EA which did not specify target flow. However, it is unclear why this is the target beyond that this was the historical flow rate prior to expansion of the channel. There is an increasing trend in water loss from the navigation channel outside the east side of the river due to bank failures (Allison et al. 2023). Reducing flow through Neptune Pass to 6% of the river’ flow may reduce navigation issues, such as shoaling, in the vicinity of Neptune Pass, but this action could create additional pressure at other locations during future high river flow events, inducing bank failures at other nearby passes. While this question may be outside of the scope of this EA, we encourage the Corps to think large-scale and long-term about management of the lowermost Mississippi River. The Lower Mississippi River Comprehensive Study is underway and should look at how to manage the river to today and the future, rather than the past.”

Response 5 – We recognize that restricting the flow in any one of the passes will result in higher river stages, which in turn will increase the head difference across the East Bank (i.e. water surface slope between the river and southeast Breton Sound). These considerations are being investigated more systematically in other studies. The justification for the restriction of flow in Neptune Pass arises from the Navigation Mission, and this effort is focused on the mitigation of that concern. However, the limited objectives of the flow restrictions in this effort, together with the use of downstream control to mitigate the flow, are both informed by the concern voiced in this comment. That is, we are trying to achieve the navigation objectives with the least reduction in flow possible, in part to limit the increase in pressure on other passes or on other locations along the East Bank.

6. **"Inclusion of a deep notch in the inlet structure will provide recreational and commercial boat access and will likely allow coarser sediment to flow into Bay Denesse and Quarantine Bay.** In the 2022 EA, the proposed structure in the Neptune Pass channel was likely to fail under a high river event. The modifications of the structure to include both inlet and outlet features will likely reduce and keep Neptune Pass flow within the target. The inclusion of a notch at the inlet structure at the confluence of Neptune Pass and the Mississippi River is a welcomed improvement in the structure design. This will allow recreational and commercial boat access to Bay Denesse, Quarantine Bay, and beyond that are currently using the pass. This desire for a deep notch has been expressed by shrimpers, crabbers, oil & gas, charter guides, and other key stakeholders. Additionally, the deep notch will allow for sediment, carried deeper in the river's water column to be captured by the pass. This flow of sediment is critical to the coastal wetlands and subaqueous delta in Quarantine Bay."

Response 6 – The sediment entering the pass is primarily fine sediment (silt and clay). Silt and clay are well-mixed in the water-column, so the elevation of the sill will not greatly influence the amount of silt and clay diverted. The sand-sized sediment that is being diverted at Neptune Pass is mostly suspended fine sand. The small size of these sand grains, in conjunction with the significant turbulence in the deep part of the river (the river is deep at the conjunction with Neptune Pass), mean that these sands are relatively well-mixed in the water column (there is always a vertical gradient of sand concentration, but it is milder at this location than it would be if the sand were coarser or the flow were less energetic). This means that the elevation of the sill is not as relevant to the concentration of sand diverted as it would be for a crevasse (or diversion) situated on top of a lateral bar. In addition, the diversion to Neptune Pass accelerates the flow (i.e. the streamlines are converging) so the diversion captures flow from the river from deeper in the water column than the sill itself. All of these elements suggest that the elevation of the sill will not significantly alter the total concentration of the sediment being diverted. To what degree that it does have influence, the notch in the sill will help to mitigate the effect. In any event, the sill elevation is integral to the design of the sill, as the elevation is the means whereby flow is regulated. The primary purpose of both the sill and the SREDS is to regulate flow. The reduction in the water discharge through Neptune Pass plays a larger role in the reduction of the *mass* of diverted sediment than does the sill elevation. This is because the mass of sediment is diverted is a function of both concentration and water discharge (mass = flow times concentration times time).

7. **"The outlet feature SREDs are a nature-based feature that can work in tandem with the inlet structure to reduce flow through Neptune Pass, but the features as described in the EA are overengineered, driving up cost of the project.** We applaud the innovation of including nature-based features as the outlet features in the EA. Incorporation of these

features in addition to the inlet structure will reduce flow through Neptune Pass and will likely help prevent episodic expansion during a high river event. Nonetheless, we believe that the SREDs described in the EA are overengineered. Earthen SREDs have been used in the West Bay Diversion outfall to slow water flow and enhance sediment deposition. Despite several high river events and the expansion of other nearby passes, the flow through West Bay has been stable since 2006 (Allison et al. 2023; Henkel, 2022). We encourage the Corps to construct the proposed SREDs only out of earthen material from the bay or dredge from the river. While there will likely be erosion of the SREDs over time, the SREDs will also encourage sediment deposition in Quarantine Bay, which will further reduce the head differential between the river and the bay. In addition, fortifying the SREDs may induce erosion of the marshes flanking Quarantine Bay which have been expanding over the last two years. The use of rock and armoring in SRED construction will likely increase the cost of the project with little added benefit. Further, it is unclear from the EA to what extent modeling has been used in the shape, placement and configuration of the SREDs. We request any data or modeling results that informed these SREDs and are eager to participate in any further discussion about the SREDs."

Response 7 – The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion. In this respect, these SREDS are different than any other sediment retention features that have been used in the Lower Mississippi River Delta, even those that were implemented in West Bay. Those features were not specifically designed to regulate flow, and hence they were not subject to the degree of erosive force to which the Neptune Pass SREDS will be subject.

Note that this requirement to protect the SREDS from erosion does not mean that the SREDS are not designed to build land. On the contrary, the SREDS are designed to create recirculation and quiescent conditions (in the lee of the SREDS) to induce deposition and accumulation of sediment, especially of silts and clays (which are the dominant sediments transported through Neptune Pass). Without the presence of the SREDS, these silts and clays tend to deposit in thin, diffuse layers offshore, and are subject to wind-wave resuspension. The induced focusing of deposition associated with the SREDS is intended to accelerate land building (i.e. the creation of emergent landforms that can vegetate).

Kenneth Ragas
E-mail received August 31, 2024
Reference Appendix B, p. 30

1. "In EA # 589 for "Neptune Pass" was there any history included pertaining to the residents of the town of Neptune Louisiana which historically existed at that location?"

Response 1 – The general outlines of your comment were utilized in evaluating the impacts of CEMVN's proposed action. That is, maps of the Mississippi River Commission as early as 1868 (MRC Chart # 82) and topographic maps as early as 1892 do show that scattered settlement and use of the land had existed in the vicinity of Neptune Pass. They also represent the continuous unbroken levee along the Mississippi River. Further, historic topographic maps (1892 – 1983) offer suggestion that a natural distributary from Bayou Tourtillon cut through marsh that became occupied by Neptune Pass, and that the residents then present in the area certainly may have taken actions both to straighten it and to use it for access to the outer bays. Finally, aerial imagery from 1985, while grainy, shows that Neptune Pass may have breached

the historic levee, closely resembling the path (but not the size) of the modern Neptune Pass. A town named Neptune is not depicted/named by topographic maps until 1957 (USGS Breton Sound). However, CEMVN has determined that material remains of the community have been destroyed by the current configuration of Neptune Pass, and, therefore, were not discussed in detail in the EA. Similarly, the significant Civil War engagement at Fort St. Philip and Fort Jackson is beyond the scope of the analysis for the actions described in EA # 589.

Alexander S. Kolker, PhD.
E-mail received September 2, 2024
Reference Appendix B, pp. 31-36

1. "It is possible, if not likely, reducing the quantity of water entering Neptune Pass could increase the quantity of water flowing through other nearby outlets. Simply put, the Corps could be moving the problem they are trying to solve, rather than directly address it. For reference, there are many other outlets in the lower Mississippi River near Neptune Pass, including a channel adjacent to the Ostrica Channel, and the Fort St Philip crevasse complex."

Response 1 – Yes. We recognize that restricting the flow in any one of the passes will result in higher river stages, which in turn will increase the head difference across the East Bank (i.e. water surface slope between the river and southeast Breton Sound). These considerations are being investigated more systematically in other studies. The justification for the restriction of flow in Neptune Pass arises from the Navigation Mission, and this effort is focused on the mitigation of that concern. However, the limited objectives of the flow restrictions in this effort, together with the use of downstream control to mitigate the flow, are both informed by the concern voiced in this comment. That is, we are trying to achieve the navigation objectives with the least reduction in flow possible, in part to limit the increase in pressure on other passes or on other locations along the East Bank.

2. Figure 24 of the Model Report indicates substantial scour in multiple channels near Neptune Pass. It is possible, if not likely, that some of the benefits that the Corps is trying to obtain could be undone by this extensive scour, and that new problems- to navigation and shipping could form. This potential needs to be evaluated in much more serious detail before proceeding.

Response 2 – See previous comment. We recognize this potential, and this is part of the reason we are limiting the restriction of flow in the pass to be just sufficient to mitigate the navigation concerns.

3. "Figure 24 of the Model Report shows the significant potential for scour to occur by the proposed Neptune Pass inlet structure. The predicted scour directly behind the inlet structure is predicted to be about 10 feet. This strikes me a relatively large amount of scour. Furthermore, if the Mississippi River experiences more large floods than used in the Model Report (which is increasingly likely with climate change), the amount of scour could be even greater. The Army Corps needs to evaluate whether the extensive scour in Neptune Pass directly downstream of the inlet structure is enough to undermine the inlet structure from the back side. If such an undermining event occurred, it could result in significant impacts to the Mississippi River- including the development of hazardous river currents and downstream shoaling. This is a potential for structure undermining should be evaluated by the Army Corps in the near term."

Response 3 – This model is intended to look at hydrodynamics and morphology of the river and channels, but is not intended for design-level evaluation of local scour potential, etc. The considerations you list here are relevant to the design of the closure structure and are being considered in that context.

4. “It is unclear what the net impacts of the Corps' action will be on dredging in the Mississippi River. While Figure 24 shows that there will be increased erosion downstream of Neptune Pass, it also shows increased deposition upstream of Neptune Pass. It is possible that the Corps is simply moving the problem, rather than seriously addressing it.”

Response 4 – The influence of flow reduction at Neptune Pass on deposition and dredging in the river is being evaluated.

5. “There is a reasonable potential that one of the structures could fail because the Army Corps has failed to address the geological and geotechnical characteristics of the landscape. Since the potential for a structural failure has not been evaluated the impacts of such a failure, on navigation and the environment have not been properly evaluated. In this critical area, the document simply does not provide enough evidence for a reasonable person to conclude that there will be no significant impact.”

Response 5 – These concerns are being addressed in the detailed design of the structures.

6. “It is possible the SREDs could erode, reducing their effectiveness. It appears that the Army Corps is concerned about the erosion of the SREDs, as they are lined with, "250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile." (Qute from the EA.) This seems like an extensive amount of material and would probably not be necessary if the Army Corps did not think that erosion was likely. Erosion of the SREDs would reduce their effectiveness, potentially leading to environmental impacts elsewhere. The Army Corps should investigate the potential for the SREDs to erode, and the impacts to the project and the environment if this erosion took place.

   The Model Report indicates that erosion is likely. The report indicates that velocities near the SREDs are predicted to be near 5- 12 feet per second, clearly fast enough to erode many coastal sediments. The predicted shear stress values are also high enough to promote erosion.

   The Army Corps needs to more closely examine the impacts of erosion on the long-term stability of the SREDs. I also call on the Corps to more closely examine the potential for other SRED designs to make the SREDs more effective. Could the SREDs be placed in a slightly different location, with a slightly different morphology, to reduce erosion and increase long-term effectiveness? There is value in the concept of using SREDs to reduce the hydraulic efficiency of a crevasse, and the public would be well served to see this approach receive additional technical rigor.

   As described above, there is also the potential for the rocks that are part of this outlet structure to sink and subside into the mud. This could create several problems including

   - A reduced efficacy of the outlet structure,
   - Hazards to navigation if these sunken stones and not well-marked.
   - Unintended side impacts to the environment.

The Army Corps needs to produce geotechnical information that shows the potential for subsidence in the outlet structure, and the impacts of subsidence on project performance and environmental impacts. This information should include items such as engineering borings/sediment cores, and compaction/compression modeling."

Response 6 – The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion. However, this does not mean that the SREDS are not designed to build land. On the contrary, the SREDS are designed to create recirculation and quiescent conditions (in the lee of the SREDS) to induce deposition and accumulation of sediment, especially of silts and clays (which are the dominant sediments transported through Neptune Pass). Without the presence of the SREDS, these silts and clays tend to deposit in thin, diffuse layers offshore, and are subject to wind-wave resuspension. The induced focusing of deposition associated with the SREDS is intended to accelerate land building (i.e. the creation of emergent landforms that can vegetate).

As you note, the SREDS are intended to accelerate the crevasse-splay cycle that you cite (Roberts, 1997), such that the friction-controlled phase of the cycle is reached sooner than it would be under natural conditions.

The potential for scour, subsidence of placed rock, and other design issues are all being factored into the final design.

7. "There is the potential for the channel of Neptune Pass to become a hypoxic or anoxic environment if the flow into Neptune Pass is reduced. Large deep holes in general have the potential for hypoxia to develop, and Neptune Pass is no different. The Army Corps should investigate the potential for hypoxia in the Neptune Pass channel, and present data documenting this investigation, before concluding that there is no significant impact."

Response 7 – This is worth considering. However, it is important to recognize that the flow is not going to be reduced significantly relative to existing flows. Note that the past several years has been relatively low flow years on the river, including extended dry season low flows. Hence, these lower flow years serve as a natural proxy for conditions associated with restricted flow into Neptune Pass. If there is no evidence of hypoxia for these current flows, it seems unlikely that the project would induce hypoxic conditions by imposing limited reductions on existing flows.

8. "The Environmental Assessment states that "Implementation of the proposed action would not result in any direct impacts to wetland resources. Construction of the inlet feature would tie into the existing bankline adjacent to Neptune Pass but would not overlap any existing vegetated wetlands."

   I am concerned that this information is not correct, and that it contradicts the Model Report. The last paragraph on p3 of the Model Report contains the following text. "Conversely, there are indications that the expansion of Neptune Pass is promoting positive impacts on environmental quality. Recent aerial imagery and observations show that sediment conveyance through Neptune Pass is aiding land building in Quarantine Bay (Quarantine Bay is a shallow embayment that serves as the immediate receiving water for Neptune Pass), especially near engineered marsh terraces built by Ducks Unlimited, and in Bay Denesse, which is the location of an environmental monitoring laboratory operated by the

Water Institute. Although an accurate estimate of Mississippi River sediment being diverted through the pass has not been established, continued growth of the subaqueous delta in Quarantine Bay and the vegetated, subaerial delta in Bay Denesse, as confirmed by aerial imagery, suggests that the pass could be harnessed for its land building processes."

Clearly, the Army Corps is aware that lands are developing in Bay Denesse and Quarantine Bay, and that the transition from subaqueous habitat to vegetated habitat has either happened or could reasonably happen in the not-too-distant future.

Furthermore, satellite imagery indicates that there is a large area that includes about 100 acres of wetlands that are developing north and west of Neptune Pass (Fig 2). These wetlands have developed - in part from sediments sourced from Neptune Pass. (There have been other activities in the area, including the construction of terraces by Ducks Unlimited). An analysis of satellite images appears to show that the outlet structures will touch these wetlands. Furthermore, the plan for the construction of the SRED calls for locally sourced sediments to be used. It appears likely that these sediments could come from areas where the wetlands are located.

There also is a smaller island that is emerging near the outfall of Neptune Pass. This island is emerging and beginning to vegetate. As such, it is a wetland that should be considered. There are a series of islands in Bay Denesse that have developed in the time since Neptune Pass developed. It is probable that these wetlands, which are about 150 acres in size total, have been augmented by the growth of Neptune Pass. The Army Corps should investigate the impact of their actions on the growth of wetlands in Bay Denesse.

Finally, Neptune Pass is contributing to the development of a large delta (Fig. 3). This appears to be the largest new delta in North America. While relatively few wetlands have developed yet, the entire area is about 3,000 to 5,000 acres of shallow and potentially emergent lands. These shallow lands could potentially develop into wetlands. The Army Corps should more closely consider the impacts to this delta and its potentially emerging wetlands, as a result of their actions."

Response 8 – Model results consistently indicate that the implementation of the SREDS would result in increased flow diversion to Bay Denesse, which in turn results in the acceleration of delta development in Bay Denesse.

The impact on the land being formed from the lateral deposition of sediments from the jet exiting Neptune Pass is being considered in the final design, with the intent on protecting these wetlands.

The development of the subaqueous delta lobes in Quarantine Bay will indeed be influenced by the implementation of the SREDS. The entire delta development process will contract, such that it is closer to the outlet of Neptune Pass. This is being considered in the final design of the project.

Rebecca Triche
Executive Director
Louisiana Wildlife Federation
Letter dated September 2, 2024

Reference Appendix B, pp. 37-38

1. “The placement of the SREDs and construction of the structure at the river’s edge will change the current landscape with channel evolution and sediment accumulation. How will the structure and SREDs be managed into the future to continue successful operation?”

Response 1 – The structure is being constructed with stable slopes based on the varying crown elevations and underlying soils, and the stone is sized to resist the recorded velocities. The structure was designed with a low spot to allow passage of some of the heavier sediment that is lower in the water column. Hydrographic monitoring surveys will be taken to monitor any developments. If warranted to further reduce hazards to navigation, the SREDs or outlet structures will be designed to increase the elevations of the receiving area in Quarantine Bay to slow the water flowing through Neptune Pass. We recognize that the river is dynamic and controlling the flow will change the current hydrodynamics. A phased approach is being used so developments can be monitored.

2. “What impact will the current design of the structure and SREDs have on the outfall area and what impact will that have on the system’s operation and longevity?”

Response 2 – Model results indicate that the SREDS will tend to alter the location of the ongoing land-building in Quarantine Bay such that the locus of land-building is closer to the outlet of Neptune Pass. Model results also indicate that the constriction of the outflow in Neptune Pass will result in more flow diverted to Bay Dennesse, thereby increase the rate of land building there.

3. “Is there an opportunity in the future to work with the Corps around the location and structure of the SREDs?”

Response 3 – The USACE partners with organizations, agencies, and non-profits to achieve shared goals. These partnerships can help with water safety, flood risk management, and more. Requests for additional information and meetings with USACE staff to discuss future partnering opportunities may be submitted at any time through our Public Affairs Office at askthecorps@usace.army.mil.

4. “What is the modeling, science, and decision-making processes that demonstrate the SREDs need to include 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile?”

Response 4 – The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion.

5. “With the fixed location armoring of the SREDs, how does that fit into long-term adaptive management of the closure and outfall area as sediment accumulates?”

Response 5 – If the construction of the SREDs is warranted, stone armoring would be required to prevent initial erosion of the dredged sediment, and the obstructions to the flow will cause sediment to settle out closer to the outlet of Neptune Pass. We recognize the sediment accumulation will be a dynamic process, the SREDs would be constructed to maximize the elevation gains close to the outlet of Neptune Pass after monitoring and assessing the

hydrodynamics following the construction of the structure on the Mississippi River at the entrance of Neptune Pass. A phased approach is being used so developments can be monitored.

6. “With a goal of limiting flow to 80,000 cfs, it appears from supporting documentation that can be accomplished with SREDs alone, what additional benefit does the sill provide?”

Response 6 – The sill provides two primary functions (1) it ensures the stability of the inlet, to reduce the risk of bank or bed collapse leading to sudden catastrophic changes in the flow at Neptune Pass and (2) it provides some reduction of flow, so the SREDS are not required to accomplish all of the reduction (i.e., the openings in the SREDS can be somewhat larger).

Richie Blink
E-mail received on September 3, 2024
Reference Appendix B, pp. 46-49

1. “Neptune Pass has been flowing at high capacities since at least 2019. Shipping has not ground to a halt and two way traffic is still in play. The purpose and need does not match the proposed actions.”

Response 1 – Do not Concur. As noted in draft EA #589, Section 1.3 Purpose and Need, “The purpose of the proposed action is to eliminate a navigational hazard in the Mississippi River. Neptune Pass is a natural crevasse which existed prior to 1985 but has increased significantly in size and flow during recent annual high river events, with a noticeable enlargement after 2019. This newly enlarged pass is diverting approximately eight times more water than the other five adjacent outlets combined in this 3-mile reach of the Mississippi River. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths. In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. The large amount of water flowing through Neptune Pass is also resulting in reports of pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation.”

9. Thankfully two major studies are underway to help manage the river for a multitude of tasks, commerce, recreation, ecosystem enhancement are all being considered. The Lower Mississippi River Comprehensive Management Study and the Mississippi River Delta Transition Initiative both investigate the possibility of a more holistically managed Mississippi River. I fear that the proposed closure at Neptune flies in the face of the spirit of these two studies. The proposed actions at Neptune should not proceed before these studies are complete….”.

Response 2 – Do not Concur. USACE is aware of the Lower Mississippi River Comprehensive Management (LMR Comp) Study and the Mississippi River Delta Transition Initiative. Simultaneously, the Rivers and Harbors Acts of 1946 and 1962, the Supplemental Appropriations Act of 1985, and the Water Resources Development Act of 1986 (Public Law 99-662) provide for the maintenance of channel dimensions of the Mississippi River from the Gulf of Mexico to Baton Rouge, Louisiana. By this authority, the USACE is authorized and obligated to perform necessary project actions to maintain the prescribed navigational dimensions of the Mississippi River. The existing conditions within the vicinity of Neptune Pass pose a threat to

navigation and commercial trade, and the potential expansion of Neptune Pass would further endanger vessels transiting the area in the absence of the proposed action. The proposed action under EA #589 in no way precludes the investigations into a potential future outcome of holistically managing the Mississippi River currently being evaluated under the LMR Comp Study and the Mississippi River Delta Transition Initiative. The important point here is that depending upon those study's results, the Mississippi River from the Gulf of Mexico to Baton Rouge, Louisiana project, to include the proposed features constructed under EA #589, can and may be modified as needed. Those other studies would have their own NEPA compliance documentation.

10. "The computer modeling used to justify this EA has not been publicly available. I have not found it on the Corps website, yet the end of the public comment period is looming. Information around the decision making process should be readily available to the public."

Response 3 – Acknowledged. As part of the Final EA #589, an Appendix will be included containing the November 2023 Neptune Pass Model Report, Numerical Investigation of Neptune Pass Hydro Morphodynamics and Control Structure, prepared by the USACE, Engineering Division, Hydrology, Hydraulics, and Coastal Engineering Branch and Lower Mississippi River and Tributaries Engineering Branch. An electronic copy of the Final EA #589 associated FONSI, and the aforementioned Appendix will be uploaded to the CEMVN District web page at: https://www.mvn.usace.army.mil/Missions/Environmental/NEPA-Compliance-Documents/Civil-Works-Projects/2024-Civil-Works/.

11. "Cost estimates have not been shared but may approach or exceed $50M US dollars."

Response 4 – Acknowledged. Cost estimates of the proposed project features are not releasable as it is Source Selection Information in accordance with FAR 2.101 and may impact a future acquisition.

12. "To minimize environmental consequences, the design, installation, and alignment of sediment retention enhancement devices (SREDs) needs to be further refined. As modeled, these SREDs seem to be doing one thing, and that's stabilizing the channel. SREDs containing rock cores are a step toward permanence that should not be taken. Instead, it may be advisable to use mined sediment from the main river channel, to help an already growing delta. Doing this can achieve joint goals of stabilizing the shipping channel and encouraging wetland growth. In addition to avoiding SRED placement of a permanent and misaligned nature, some SRED placement is slated directly on top of existing wetlands and it appears the modeling was using imagery from 2019, before a significant land growth push in Quarantine Bay."

Response 5 – The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion. In this respect, these SREDS are different than any other sediment retention features that have been used in the Lower Mississippi River Delta. Those features were not specifically designed to regulate flow, and hence they were not subject to the degree of erosive force to which the Neptune Pass SREDS will be subject.

Note that this requirement to protect the SREDS from erosion does not mean that the SREDS are not designed to build land. On the contrary, the SREDS are designed to create

recirculation and quiescent conditions (in the lee of the SREDS) to induce deposition and accumulation of sediment, especially of silts and clays (which are the dominant sediments transported through Neptune Pass). Without the presence of the SREDS, these silts and clays tend to deposit in thin, diffuse layers offshore, and are subject to wind-wave resuspension. The induced focusing of deposition associated with the SREDS is intended to accelerate land building (i.e. the creation of emergent landforms that can vegetate).

13. "Just on the upstream side of the proposed terrace field sits 126 acres of freshwater marsh and flats colonized by submerged aquatic vegetation. This area will be directly impacted by construction activities. Secondary impacts to the prodelta will come in the form of flow reductions and reductions of sediment supplies. These wetlands are due consideration under the Clean Water Act Section 404."

Response 6 – Acknowledged. During the public review period for draft EA #589, public comments were also solicited for the CWA Section 404(b)(1) Public Notice. It should be noted that both the 30-day NEPA public comment period and CWA Section 404(b)(1) Public Notice comment period began Friday August 2, 2024, and while officially ending on Saturday August 31, 2024, USACE recognized that this period coincided with Labor Day Weekend and a designated Federal Holiday on Monday September 2, 2024. As such, USACE continued to accept comments provided either electronically or postmarked via U.S. Postal Mail through Tuesday, September 3, 2024 (total comment period of 33-days). A Section 404(b)(1) short form evaluation was signed on February 12, 2025. As noted in draft EA #589, Section 4.3 Wetlands, Future Conditions with the Proposed Action, "Indirectly, with construction of the inlet feature, cross-sectional area of the pass at the structure site will be reduced by 88 percent, reducing the freshwater influence of the river and the sediment it transports. It is anticipated that the splay-nourishing suspended sediment will continue to be maintained through a combination of sediment that flows through the inlet structure while being captured with the outlet structure (SREDs). Any existing deltaic splays would likely experience no major changes (i.e., no growth and no loss). Implementation of the outlet features (SREDs) would result in indirect impacts to wetland resources within Quarantine Bay and potentially other waterways in the vicinity of the project as the flow through Neptune Pass would be reduced following project completion. These impacts are primarily associated with the indirect effects of the reduction in sediment deposition following project completion. The sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound would now be trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay."

14. "I urge the reviewing body to consider these new wetlands and the positive transformation of ecological health by thoughtfully adjusting the SRED alignment to ensure the longevity of these existing wetlands. The existence of these freshwater marshes and the plans to destroy them by placing SREDs at that location may invalidate the finding of no significant impact or FONSI."

Response 7 – Do not concur. Reference Response 6. The USACE has evaluated the potential environmental impacts of the proposed action in draft EA #589. As noted in draft EA #589, "While unavoidable impacts to relevant resources would occur due to project actions within

Neptune Pass and Quarantine Bay, the proposed action would not constitute a major federal action significantly affecting the human environment." Based on this assessment, a review of the comments received during public review periods, a determination has been made that the proposed action would have no significant impact on the environment.

15. "An additional alternative of injecting sediment near the mouth of Neptune Pass would avoid wetland impacts from SRED construction. This softer approach may be less expensive than transporting several hundred barges of stones to this location."

Response 8 – The justification for this project is to protect navigation in the Mississippi River by controlling and limiting the discharge through Neptune Pass. Adding sand to Neptune Pass could theoretically mitigate the flow of the pass over time (as the crevasse-delta builds), but this would be an ancillary benefit that cannot be quantified without significant uncertainty. Hence, it is not appropriate to include it as part of this project.

16. "The notch in the proposed closure needs to be deeper."

Response 9 – The sediment entering the pass is primarily fine sediment (silt and clay). Silt and clay are well-mixed in the water-column, so the elevation of the sill will not greatly influence the amount of silt and clay diverted. The sand-sized sediment that is being diverted at Neptune Pass is mostly suspended fine sand. The small size of these sand grains, in conjunction with the significant turbulence in the deep part of the river (the river is deep at the conjunction with Neptune Pass), mean that these sands are relatively well-mixed in the water column (there is always a vertical gradient of sand concentration, but it is milder at this location than it would be if the sand were coarser or the flow were less energetic). This means that the elevation of the sill is not as relevant to the concentration of sand diverted as it would be for a crevasse (or diversion) situated on top of a lateral bar. In addition, the diversion to Neptune Pass accelerates the flow (i.e. the streamlines are converging) so the diversion captures flow from the river from deeper in the water column than the sill itself. All of these elements suggest that the elevation of the sill will not significantly alter the total concentration of the sediment being diverted. In any event, the sill elevation is integral to the design of the sill, as the elevation is the means whereby flow is regulated. The primary purpose of both the sill and the SREDS is to regulate flow. The reduction in the water discharge through Neptune Pass plays a larger role in the reduction of the *mass* of diverted sediment than does the sill elevation. This is because the mass of sediment is diverted is a function of both concentration and water discharge (mass = flow times concentration times time).

17. "Already the Corps has thrown dozens of barges of rocks into this location which was brought up from -95' to -35'. The current rock wall is serving as a sediment excluder. This high wall could be thoughtfully modified to optimize the sediment to water ratio."

Response 10 – Do not concur. EA #595, Neptune Pass Emergency Armoring, Plaquemines Parish, Louisiana, addressed potential impacts associated with emergency construction of a stone revetment structure along the eastern bank of the mouth of Neptune Pass, adjacent to Mississippi River mile 23.9, in Plaquemines Parish, Louisiana. The emergency action required placement of approximately 58,000 tons of stone by barge mounted equipment positioned both within the Pass and Mississippi River to stabilize the rapidly eroding eastern bank of the mouth of Neptune Pass. The stone was placed in open water and no wetlands within the area were impacted by the action. The project area is approximately 8 acres of open water located along the eastern bank of the mouth of Neptune Pass. Construction of the stone revetment structure was completed on June 3, 2023. A FONSI was signed for EA #595 on March 13, 2024.

18. “Designating the confluence of the Mississippi and Neptune a hopper dredge disposal area (HDDA) could lead to more sediment entering the system. I was shocked to see this was not utilized when some light dredging was done just downstream of Neptune. Designating a HDDA at this location could be a good management of the river.”

Response 11 – The justification for this project is to protect navigation in the Mississippi River by controlling and limiting the discharge through Neptune Pass. Adding sand to Neptune Pass could theoretically mitigate the flow of the pass over time (as the crevasse-delta builds), but this would be an ancillary benefit that cannot be quantified without significant uncertainty. Hence, it is not appropriate to include it as part of this project.

Ethan J. Melancon, MPA
Letter dated September 3, 2024
Reference Appendix B, pp. 54-56

1. “…we question whether it is necessary to restrict flow to the extent proposed. The EA does not provide data or modeling to fully explain and justify the proposed depth of the sill and notch. We would like to see the scientific analysis that informs the proposed actions.”

Response 1 – The justification for the targeted flow reduction is based on navigation criteria. The details of this analysis are given in the technical report (Appendix C).

2. “We question whether it is necessary or desirable to engineer the SREDs so extensively. We would like to see the scientific analysis that informed the proposed structures. a redesign of the SREDs without rock and geotextile so that they can adapt and change with the environment, similar to the design of the SREDs that were installed at the West Bay Sediment Diversion. We believe this redesign would reflect the corps’ request to embrace nature-based solutions in civil works projects. A corps memorandum on the request states: “*In planning and developing CW projects, USACE will present all possible solutions, including the use of NBS, clearly and transparently to inform the recommendation for the final project authorized by Congress for federal action*.” We are hopeful that this design would also prevent costly overengineering so that resources could be invested instead in efforts to maximize the land-building potential of the pass. use of sediment from the river to build the SREDs. We note the plan calls for locally sourced sediments. We are concerned that dredging from Quarantine Bay could undermine the significant land-building process that has occurred in recent years.”

Response 2 – The primary purpose of the SREDS is to control water discharge at Neptune Pass. They accomplish this by forcing the flow through narrow openings, thus restricting the flow at the downstream end. Since the flow velocities at these openings will be significant, it is necessary to design the SREDS such that they can resist erosion. In this respect, these SREDS are different than any other sediment retention features that have been used in the Lower Mississippi River Delta, even those that were implemented in West Bay. Those features were not specifically designed to regulate flow, and hence they were not subject to the degree of erosive force to which the Neptune Pass SREDS will be subject.

Note that this requirement to protect the SREDS from erosion does not mean that the SREDS are not designed to build land. On the contrary, the SREDS are designed to create recirculation and quiescent conditions (in the lee of the SREDS) to induce deposition and accumulation of sediment, especially of silts and clays (which are the dominant sediments

transported through Neptune Pass). Without the presence of the SREDS, these silts and clays tend to deposit in thin, diffuse layers offshore, and are subject to wind-wave resuspension. The induced focusing of deposition associated with the SREDS is intended to accelerate land building (i.e. the creation of emergent landforms that can vegetate).

3. "We disagree with the finding that the project will have no significant impact on the environment. Constricting flow through Neptune Pass will undermine ongoing land building in Quarantine Bay, and sourcing sediment for SREDs from the receiving zone could eliminate land-building benefits that have been realized from the pass over the past few years by transforming new land and wetlands and shallow water SAV habitat into open water. We recommend that the corps undertake a full EIS in order to fully assess modifications and additional actions that could lead to additional land building such as use of dredged material from the river to augment the natural processes that are occurring."

Response 3 – Do not concur. As noted in draft EA #589, Section 4.2 Aquatic Resources/Fisheries, Future Conditions with the Proposed Action, "With implementation of the proposed action, water bottom habitat loss and displacement of benthic organisms and fishes within the project area would occur at both the inlet structure at the entrance of Neptune Pass and outlet structures (SREDs) in Quarantine Bay. However, these effects are expected to be temporary." "…the flow control feature is also expected to slow the incoming flow from the Mississippi River into Neptune Pass, allowing for some suspended sediments to settle in the area surrounding the project." Additionally, as stated in Section 4.3 Wetlands, Future Conditions with the Proposed Action, "Indirectly, with construction of the inlet feature, cross-sectional area of the pass at the structure site will be reduced by 88 percent, reducing the freshwater influence of the river and the sediment it transports. It is anticipated that the splay-nourishing suspended sediment will continue to be maintained through a combination of sediment that flows through the inlet structure while being captured with the outlet structure (SREDs). Any existing deltaic splays would likely experience no major changes (i.e., no growth and no loss). Implementation of the outlet features (SREDs) would result in indirect impacts to wetland resources within Quarantine Bay and potentially other waterways in the vicinity of the project as the flow through Neptune Pass would be reduced following project completion. These impacts are primarily associated with the indirect effects of the reduction in sediment deposition following project completion. The sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound would now be trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay." The USACE has evaluated the potential environmental impacts of the proposed action in draft EA #589. As noted in draft EA #589, "While unavoidable impacts to relevant resources would occur due to project actions within Neptune Pass and Quarantine Bay, the proposed action would not constitute a major federal action significantly affecting the human environment." Based on this assessment, a review of the comments received during public review periods, a determination has been made that the proposed action would have no significant impact on the environment. Therefore, an Environmental Impact Statement will not be prepared.

4. “a deeper notch in the sill at the opening of the pass, to capture heavier particles of sediment at the bottom of the river channel. a deeper sill to allow for more flow from the river into the pass, while also ensuring safe navigation on the river.”

Response 4 – The sediment entering the pass is primarily fine sediment (silt and clay). Silt and clay are well-mixed in the water-column, so the elevation of the sill will not greatly influence the amount of silt and clay diverted. The sand-sized sediment that is being diverted at Neptune Pass is mostly suspended fine sand. The small size of these sand grains, in conjunction with the significant turbulence in the deep part of the river (the river is deep at the conjunction with Neptune Pass), mean that these sands are relatively well-mixed in the water column (there is always a vertical gradient of sand concentration, but it is milder at this location than it would be if the sand were coarser or the flow were less energetic). This means that the elevation of the sill is not as relevant to the concentration of sand diverted as it would be for a crevasse (or diversion) situated on top of a lateral bar. In addition, the diversion to Neptune Pass accelerates the flow (i.e. the streamlines are converging) so the diversion captures flow from the river from deeper in the water column than the sill itself. All of these elements suggest that the elevation of the sill will not significantly alter the total concentration of the sediment being diverted. In any event, the sill elevation is integral to the design of the sill, as the elevation is the means whereby flow is regulated. The primary purpose of both the sill and the SREDS is to regulate flow. The reduction in the water discharge through Neptune Pass plays a larger role in the reduction of the *mass* of diverted sediment than does the sill elevation. This is because the mass of sediment is diverted is a function of both concentration and water discharge (mass = flow times concentration times time).

5. “an incremental approach whereby the notch and/or sill could be raised over time should monitoring data indicate that necessary.”

Response 5 – Acknowledged. USACE determined that a phased construction approach of the inlet and outlet structures was warranted to further assess the real time effects on Navigation during periods of high river flow and to be able to plan efficient and cost effective follow up actions, as needed. The proposed phased construction and real time monitoring approach would include the following:

- Phase 1 - construction of a modified, less restrictive stone inlet structure at the at the entrance of Neptune Pass that is similar to the proposed structure as described in draft EA #589.
- If warranted, Phase 2 - raise the Phase 1 stone structure to further reduce the cross-sectional area of the entrance of Neptune Pass.
- If warranted, Phase 3 - construct the outlet structures (i.e., Sediment Retention Enhancement Devices (SREDs)) in a modified configuration. The SREDs would be designed to increase the elevations in Quarantine Bay at the outlet of Neptune Pass to back up the flow and decrease the flow capacity. The SREDs would consist of dredged material, stone, geotextile, wooden piles, or a combination of these options.
- Upon completion of each phase of construction, multibeam surveys and flow measurements will be conducted routinely to assess the effects to bathymetry and flow in Neptune Pass and the Mississippi River. Post construction of the inlet structure, USACE will engage with the navigation industry to determine any positive or negative real time effects on navigation.

The modeled flow after Phase 1 construction of the revised design inlet structure is expected to be approximately 125,000 cubic feet per second (cfs) at a Mississippi River flow of 1 million cfs. If Phase 2 and Phase 3 are constructed, once those features are complete, the target flow is expected to be approximately 80,000 cfs at a Mississippi River flow of 1 million cfs.

6. "design of SREDs informed by up-to-date information about the new lands and wetlands that have been created by the deposition of sediment into Quarantine Bay and other areas in the outflow area of the pass. We are concerned that the SREDs must add to, and not diminish, past and future land building in the receiving zone. Community engagement in the SRED design, construction and adaptive management."

Response 6 – Acknowledged. As noted in draft EA #589, Section 4.3 Wetlands, Future Conditions with the Proposed Action, "Indirectly, with construction of the inlet feature, cross-sectional area of the pass at the structure site will be reduced by 88 percent, reducing the freshwater influence of the river and the sediment it transports. It is anticipated that the splay-nourishing suspended sediment will continue to be maintained through a combination of sediment that flows through the inlet structure while being captured with the outlet structure (SREDs). Any existing deltaic splays would likely experience no major changes (i.e., no growth and no loss). Implementation of the outlet features (SREDs) would result in indirect impacts to wetland resources within Quarantine Bay and potentially other waterways in the vicinity of the project as the flow through Neptune Pass would be reduced following project completion. These impacts are primarily associated with the indirect effects of the reduction in sediment deposition following project completion. The sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound would now be trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay." USACE acknowledges and concurs with the need to continue "Community engagement in the SRED design, construction and adaptive management." Requests for additional meetings with USACE staff to discuss design and progress of the project may be submitted at any time through our Public Affairs Office at asktheccorps@usace.army.mil.

7. "We ask that the corps consider whether that dredged material can be used to accelerate the land-building potential of Neptune Pass, by transporting the sediment to the pass and depositing it on the outfall side of the sill. We believe this relatively low-tech and low-cost strategy could significantly increase the rate at which healthy wetlands are forming, and the expense could possibly be defrayed if the work is considered mitigation for other work conducted along our coast. We also believe it would reflect the corps' request to "*consider water resources problems holistically and consider comprehensive solutions that may include alternatives beyond USACE's missions.*"

Response 7 – The justification for this project is to protect navigation in the Mississippi River by controlling and limiting the discharge through Neptune Pass. Adding sand to Neptune Pass could theoretically mitigate the flow of the pass over time (as the crevasse-delta builds), but this would be an ancillary benefit that cannot be quantified without significant uncertainty. Hence, it is not appropriate to include it as part of this project.

8. “We also would like to know how the work proposed in the EA would affect the Ostrica Lock, Bayou Lamoque and other points where the river is connected to wetlands downriver from New Orleans.”

Response 8 – We recognize that restricting the flow in any one of the passes will result in higher river stages, which in turn will increase the head difference across the East Bank (i.e. water surface slope between the river and southeast Breton Sound). These considerations are being investigated more systematically in other studies. The justification for the restriction of flow in Neptune Pass arises from the Navigation Mission, and this effort is focused on the mitigation of that concern. However, the limited objectives of the flow restrictions in this effort, together with the use of downstream control to mitigate the flow, are both informed by the concern voiced in this comment. That is, we are trying to achieve the navigation objectives with the least reduction in flow possible, in part to limit the increase in pressure on other passes or on other locations along the East Bank.

Appendix C

Draft November 2023 Neptune Pass Model Report

US Army Corps of Engineers ®

Mississippi River Valley Division
New Orleans District (CEMVN)

Neptune Pass Model Report

Numerical Investigation of Neptune Pass Hydro-Morphodynamics and Control Structure*

November 2023

Prepared by Katelyn Keller (MVN-EDH) and Brendan Yuill (MVN-EDR)

Reviewed by Deborah Centola (MVN-EDR), Katelyn Costanza (MVN-EDH), and Gary Brown (ERDC-CHL)

* Based on current proposed Neptune Pass closure designs (November 2023). This report may be revised/updated in the event of future proposed design changes.

Contents

Introduction

The eastern (left descending) bank of the Lower Mississippi River (LMR) levee system from Bohemia (River Mile 45 Above Head of Passes; AHP) to Baptiste Collette (River Mile 11 AHP) is largely undeveloped. While portions of the bankline are revetted to protect the stability of the navigation channel, most of the river maintains a natural connection to the neighboring marshland by permitting overbank conveyance of river water and sediment during high water. Although the cumulative loss in stream power in this 34-mile reach of the river has been shown to influence shoaling patterns in the lowermost river (i.e., from Venice to the Southwest Pass Jetties), the New Orleans District (MVN) has typically allowed individual crevasses to persist if there were no apparent localized impacts to commercial navigation associated with their presence.

Neptune Pass is one of these naturally formed distributary channels of the LMR, located at River Mile 24 AHP just downstream of the Ostrica Lock system and upstream of the Fort Saint Phillip distributary complex along the eastern riverbank (Figure 1). Neptune Pass is located along a reach in the lower delta particularly prone to crevasse formation. This reach is prone to crevasse formation due to the large difference in water surface elevation between the river and the receiving water (Southwest Breton Sound) during high river discharges, combined with the relatively short length (~1 mile) of emergent land separating the river and Southwest Breton Sound.

Neptune Pass channel is visible in aerial photography dating back to the mid-1990s but remained relatively insignificant, in terms of width (~100 ft) and discharge (< 5,000 cfs), for more than 20 years. Following the exceptionally high 2019 spring flood of the LMR, Neptune Pass crevasse began to rapidly expand, currently measuring an average of 800 ft in width and capturing 14.5% - 20% of the LMR flow at that location. Uncontrolled flow diverted through Neptune Pass because of this expansion has resulted in several negative impacts on stability of the LMR navigation channel. Impacts to vessel traffic within the navigation channel were first reported in the spring of 2022 as vessel pilots reported that currents generated by the inflow of water into the crevasse affected vessel steering, making passage potentially hazardous (note that the navigation channel is located along the left descending bankline of the Mississippi River at this location). By May of 2022, the loss of river discharge through Neptune Pass had decreased the river sediment transport capacity sufficiently to induce significant shoaling just downstream of Neptune Pass. This shoaling resulted in the need for dredging immediately downstream of the crevasse entrance to maintain the authorized depth in the navigation channel. Furthermore, data collected during the 2023 low flow period and subsequent saltwater wedge sill construction suggest the expansion of Neptune Pass is increasing the rate of salinity intrusion into the lower river.

Conversely, there are indications that the expansion of Neptune Pass is promoting positive impacts on environmental quality. Recent aerial imagery and observations show that sediment conveyance through Neptune Pass is aiding land building in Quarantine Bay (Quarantine Bay is a shallow embayment that serves as the immediate receiving water for Neptune Pass), especially near engineered marsh terraces built by Ducks Unlimited, and in Bay Denesse, which is the location of an environmental monitoring laboratory operated by the Water Institute. Although an accurate estimate of Mississippi River sediment being diverted through the pass has not been established, continued growth of the subaqueous delta in Quarantine Bay and the vegetated, subaerial delta in Bay Denesse, as confirmed by aerial imagery, suggests that the pass could be harnessed for its land building processes. This opportunity, which

seemingly pits navigational and environmental goals against each other, occurs at a time of unprecedented coastal land loss in Louisiana.

This study investigates scenarios that are designed to reduce the deleterious effects of the present state of Neptune Pass on MVN's LMR management mission (e.g., maintaining the navigation channel to authorized dimensions, mitigating the impact of the Navigation channel on saltwater intrusion) while maintaining some environmental benefits from the flow of river water and sediment into the nearby marshland and basins. This study employs numerical modeling to simulate the hydrodynamics and sediment dynamics through the area of interest.

The objective of this study is to assess the performance of a suite of management scenarios designed to constrain the flow through Neptune Pass to an optimal magnitude at high river discharge. The optimal discharge was designed to allow for the maximum diversion of flow and sediment without affecting vessel steering within the LMR navigation channel. The scenarios were also assessed to determine the stability of the closure structure(s), in terms of the risk of flanking failure and/or neighboring marsh erosion. Deleterious scour associated with steep spatial gradients of head differential could potentially result in flanking failure of structures, and/or reroute flow entering Neptune Pass into alternative pathways causing additional crevasse formations.

This effort uses a two-dimensional Delft3D-FM hydro-morphodynamic model. Delft3D-FM is a mature numerical modeling package that calculates the flow of water and sediment due to a range of physical forcings including currents, tides, and wind. Delft3D-FM is routinely used by industry, resource management agencies, and academia. Comparison of model outputs between management scenarios are presented with a focus on changes in water levels, velocities, bed shear stress, sediment transport, and morphology of both the receiving basin and Mississippi River. Management scenarios include a future without action scenario and scenarios simulating the inclusion of different engineered structures within the flow field. The engineered structures are of two types: 'Sills', which are herein defined as stone structures within Neptune Pass that are constructed perpendicular to the mean approach flow direction, and 'Sediment Retention Enhancement Devices (SREDs)', which are herein defined as structures constructed of in-situ bed sediment in the receiving water (Quarantine Bay) designed to impede flow and induce sediment deposition. The findings of these analyses provide general insight into the management of new or expanding crevasses, identify viable engineering alternatives for crevasse regulation, and demonstrate ways to reduce potential future conflicts between navigation and environmental interests. A final recommendation and justification for the implementation of control structures(s) is given, with a monitoring plan to maximize project success.

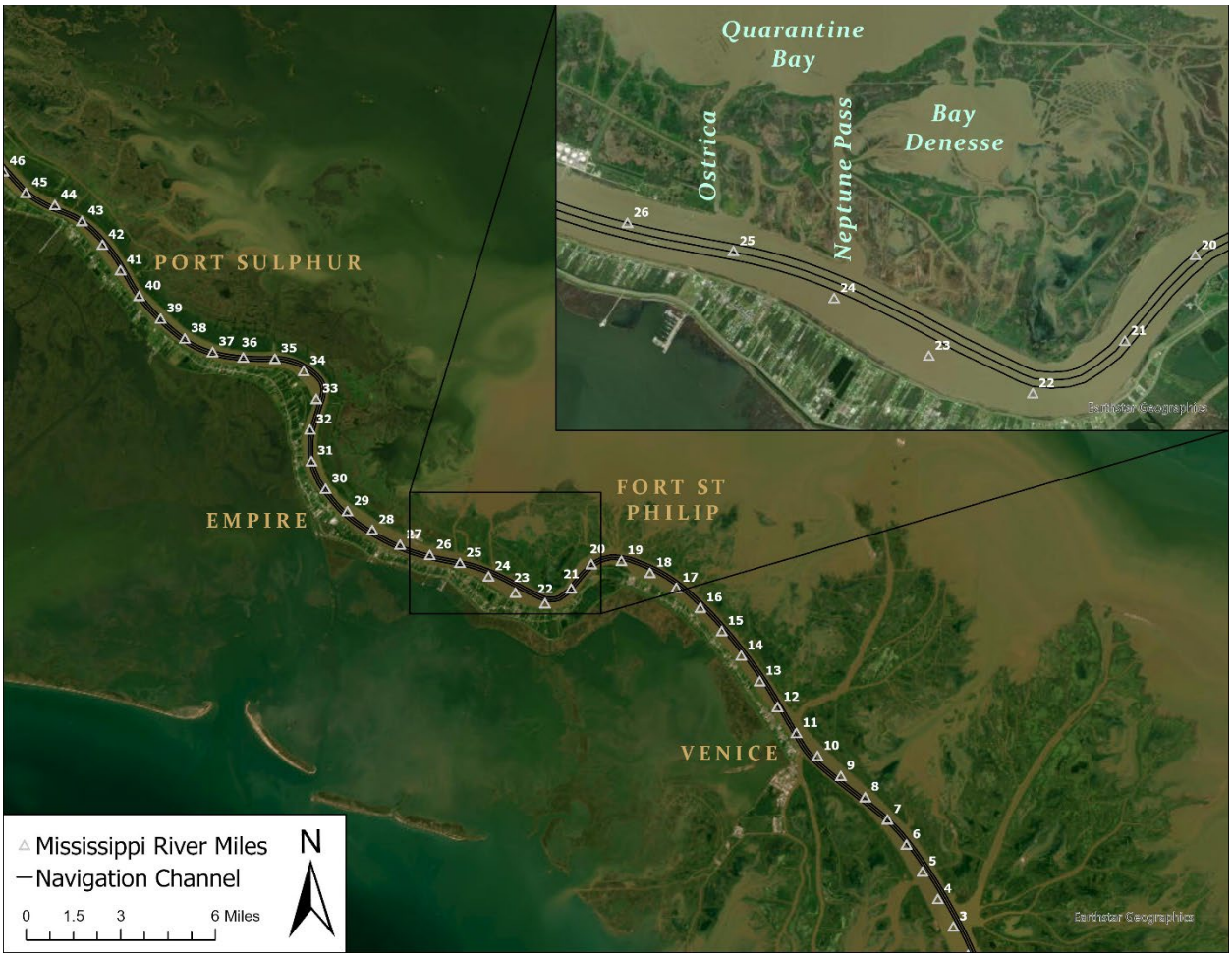


Figure 1. Area of Interest. Downstream of RM 45, the left-descending bank of the Mississippi River is not protected by levees, and several distributaries exist. Neptune Pass, at RM 24, is a recently formed distributary that continues to grow, causing navigational hazards, shoaling, and increased salinity intrusion.

Model Development

A two-dimensional (depth averaged) Delft3D Flexible Mesh model was generated using both the hydrodynamic (Flow) and morphodynamic/sediment transport (Morpho) modules to simulate the Mississippi River, Neptune Pass, and receiving basins. The model domain extends upstream to River Mile 37 AHP to capture the flow dynamics developed in the upstream meander bend and extends downstream to Mile 11 AHP near the Venice, LA river gage. The computational mesh contains 100,000 cells. The mesh is curvilinear in the LMR and Neptune Pass channels with cell dimensions on the order of 30 ft in length and consists of irregularly shaped triangles over marshes and in the receiving basins.

The model has three open boundaries. The upstream river boundary simulates the inflow of the LMR; the downstream river boundary simulates river stage at the LMR outlet near Venice, LA; the marine boundary simulates water level of Breton Sound/Quarantine Bay at the eastern margins of the model domain. Key model parameters are given in Table 1. Parameters were based on existing literature when available or determined during model calibration.

Table 1. Key Model Parameters.

Parameter		Value
Hydraulic roughness (Chezy)		
	LMR and open water	70
	Marsh	60 – 45 (varies with depth)
	Neptune Pass and outlet	50
Eddy viscosity (m^2/s)		1
Eddy diffusivity (m^2/s)		1
Sediment concentration (kg/m^3)	Sand	0.01
	Fine	0.1
Erosion critical stress (N/m^2)	Marsh	1
Sedimentation critical stress (N/m^2)	Marsh	1000
Median sediment diameter (m)	Sand	0.0002

To comparatively assess the flow reduction and sediment transport ability of alternatives, the model was used to simulate flow and sediment transport for scenarios that utilized a constant (i.e., steady) discharge at the LMR inflow boundary (500 kcfs, 800 kcfs, and 1,200 kcfs). Delft3D is an unsteady flow model. Therefore, to achieve steady flow, a constant discharge hydrograph was simulated at the LMR inlet until the velocity field reached approximate steady-state throughout the model domain. Model scenarios were simulated for at least 24 hours (the steady-state flow field was typically achieved within the first 12 hours). The final computed values during a scenario were used as the steady flow values.

To estimate sediment transport values within the model, three sediment types were simulated. A non-cohesive sand type was modeled to simulate fluvial sand transport, a cohesive silt type was modeled to simulate the fluvial fine sediment contribution to deposition within the LMR estuary, and a marsh sediment type was modeled to simulate consolidated fine sediment and accumulated organic material composing marsh bed sediment. During model runs that simulated sediment transport, the river channel bed included a 6 ft layer of sand, and the marsh bed included a 6 ft layer of marsh sediment. Bed elevation changes were not permitted, allowing interactions between bottom sediment and the water column without providing morphological feedback to the hydrodynamics. These assumptions were aligned with previous morphodynamic models of LMR sediment diversions (Baustian et al., 2018). Sand and silt sediment were introduced into the model domain at the LMR inflow boundary at a concentration of 0.01 and 0.1 kg/m^3 respectively for all discharges. The Van Rijn 2007 sediment transport formula was used to calculate sand transport within the model domain, and the Partheniades-Krone formula was used to calculate fine sediment transport within the domain. Note that the objective of the sediment transport modeling in this study was not to develop a model of sufficient fidelity to reproduce observed values of sediment dynamics, but merely to assess the effect of management scenarios on sediment transport through Neptune Pass relative to each other. Therefore, it is assumed that the ability to accurately simulate the values of sediment supply within the modeled scenarios was not vital to the study objectives, providing the values were qualitatively consistent with observations and that they were held constant for all scenarios.

Following analyses of the alternatives, the selected optimal scenario was modeled for unsteady conditions, and morphological bed changes were activated. The goal of this analysis was to determine long-term impacts and structure functionality due to bathymetric changes and subsequent

hydrodynamic effects over 5 years. Impacts to shoaling in the Mississippi River, land creation in Quarantine Bay, and changes in neighboring marshes and passes were analyzed by comparing model output to a no action alternative. The upstream boundary was forced with a synthetic hydrograph that represents the typical flow of the Mississippi River over a water year (October 1st to September 30th). The input hydrograph was created by averaging the daily mean flow at Belle Chasse over the last 15 years and scaling the discharge up to include a 1,000,000 cfs flow during spring flood (Figure 2). Sand and fine sediment concentration at the inflow was calculated based on discharge using rating curve formulas developed through previous measurements of sediment loads in the LMR (Baustian et al., 2018). A morphological acceleration factor of 40 was applied and the hydrograph scaled accordingly to reduce computation time. The resulting input hygrograph was used to simulate 5 years of Mississippi River flow and subsequent bathymetric changes.

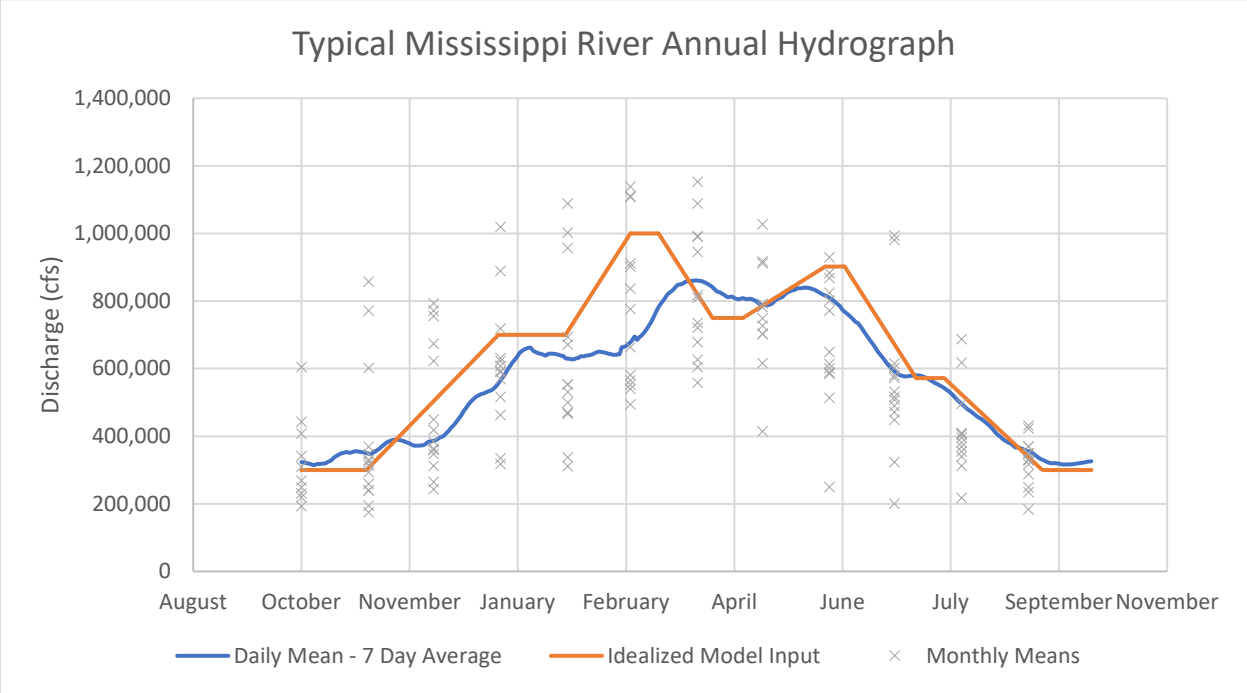


Figure 2. Typical Mississippi River Flow Hydrograph. The blue line represents the mean daily discharge at Belle Chasse over 15 years. The orange line was used as model input for the recommended alternative simulation and includes a peak flow of 1,000,000 cfs.

Calibration and Validation

Extensive calibration efforts were performed on the model using the substantial amount of data collected by the USACE MVN Stream Gaging Section. Mississippi River discharge measurements upstream and downstream of Neptune Pass and discharge measurements within Neptune and Ostrica Passes were collected over a time span ranging from May 2022 – September 2023, including high flow and low flow conditions. The collected discharge measurements were collected using acoustic doppler current profile (ADCP) devices, which allowed for detailed calibration on bank-to-bank depth-averaged velocity profiles (DAV) as well. Multiple measurements also included Mississippi River and Quarantine Bay stage readings, which allowed calibration to the water surface profile along Neptune Pass (Figure 3).

Calibration was completed through refinement of the grid and bathymetry in areas of interest and through variations in river, pass, and marsh roughness values until desired discharges, velocity profiles, and water level profiles were met. To calibrate the model to observed measurements of flow partitioning between the LMR and Neptune Pass, the model was simulated with an unsteady upstream hydrograph rising from 250,000 cfs to 1,200,000 cfs and falling back to 250,000 over 7 days simulation time.

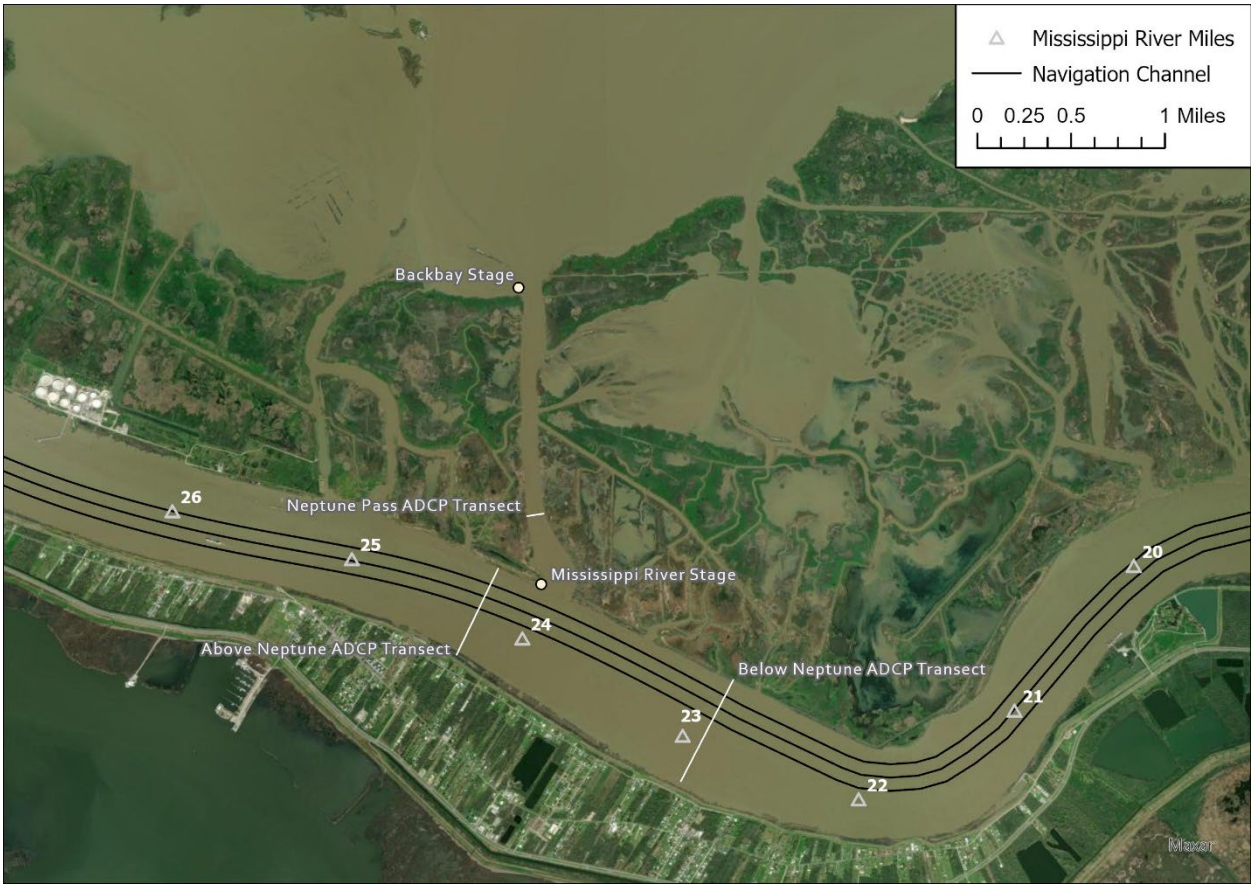
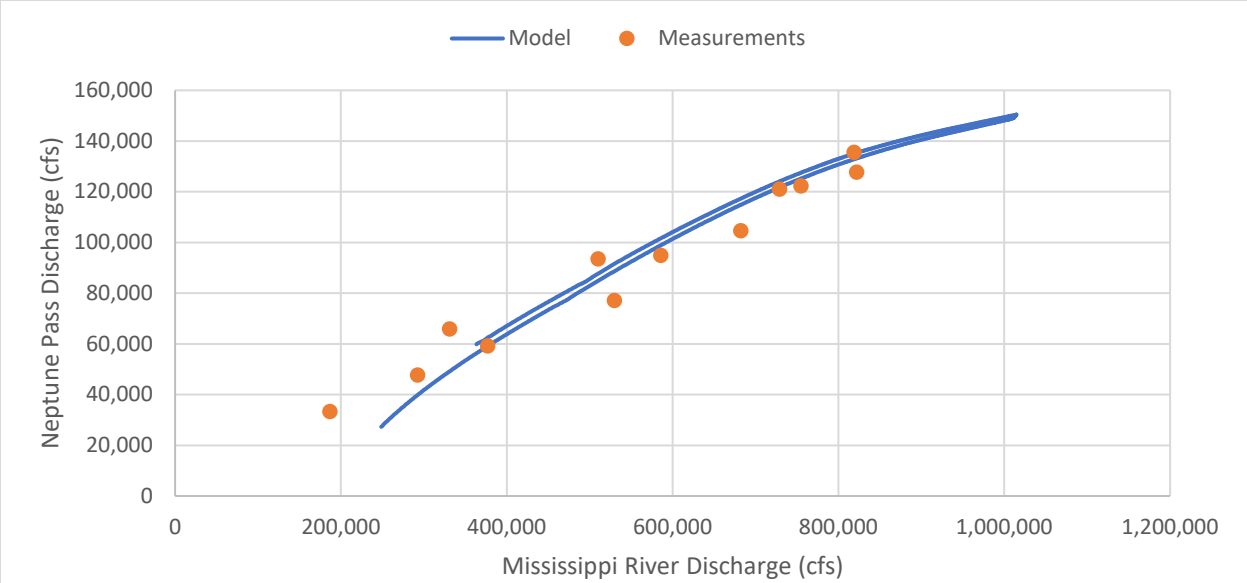


Figure 3. Measurement Locations. ADCP measurements and stage readings collected by USACE from May 2022 to September 2023 were used to calibrate and validate model outputs. The ADCP transects used included those three shown above in the Mississippi River above Neptune Pass, in the Mississippi River below Neptune Pass, and in Neptune Pass. Stage readings were collected in the Mississippi River just upstream of the pass inlet and in Quarantine Bay just downstream of the pass outlet.



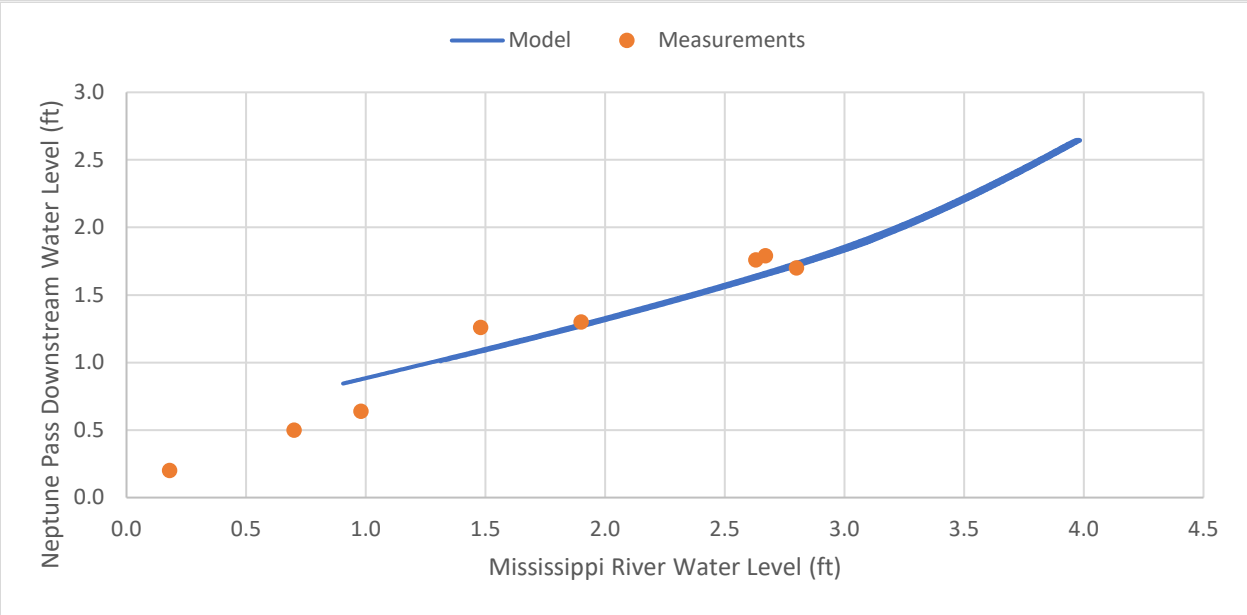


Figure 4. Discharge and Water Level Model Performance. The blue line represents model output. Orange circles represent USACE collected field measurements. Comparison shows good correlation between model output and observations.

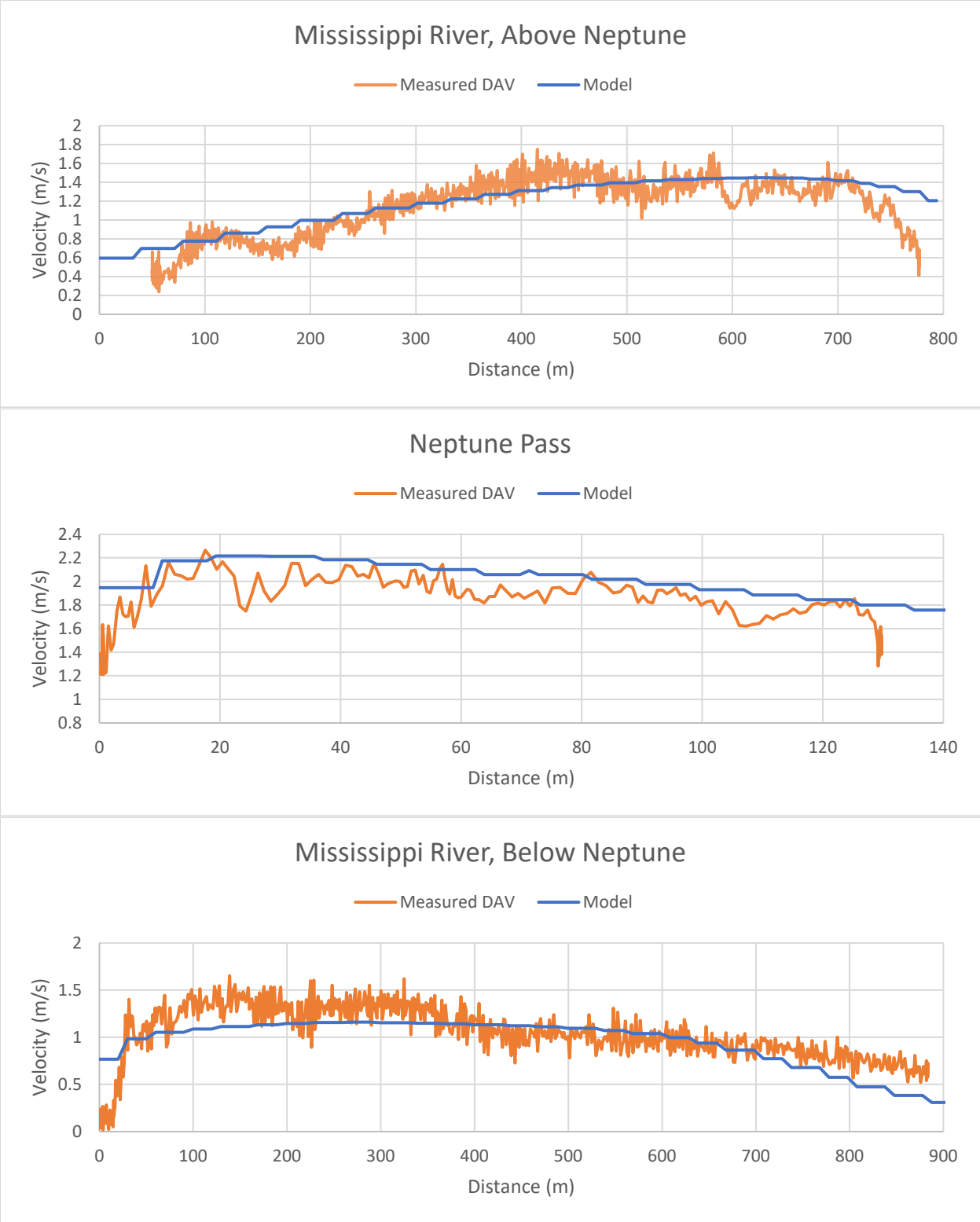


Figure 5. Depth-Averaged Velocity Model Performance. Selected velocity event occurring May 25, 2022, shown above, shows bank-to-bank measured and modeled DAV profiles in the Mississippi River above and below Neptune Pass and in Neptune Pass. Transects are measured from left descending bank (Station 0) to right descending bank. River discharge during the event was 755,000 cfs.

The model performed well in all flow conditions with no significant pattern of bias, reproducing observed velocity patterns, water level profiles, and flow distributions. Corroboration with ERDC's mature Lower Mississippi River Adaptive Hydraulics (AdH) model further confirmed model performance: ADH model results predicted similar velocity patterns, discharge quantities, water surface profiles, and morphological changes (Gary Brown, pers comm).

It should be noted that there are inherent uncertainties associated with hydro-morphodynamic modeling. While the uncertainty in this model has been significantly decreased through calibration and corroboration efforts, model results should be considered representative of the system generally and not deterministic forecasts. Vertical variations in velocities and sediment concentrations are approximated in a two-dimensional model and may be erroneous in areas with complex flow fields such as near steep bathymetric changes or strong secondary currents, such as the scour hole near the upstream end of Neptune Pass.

Design Flow

In order to analyze the viability of various control structure alternatives, a maximum desired design flow allotted through Neptune Pass was chosen based on the threshold discharge at which hazardous vessel conditions were noted by pilots. It was reported that northbound vessels began experiencing the draw-down effects associated with flow through Neptune Pass when the Carrollton river gage is near 9' – 13' (Crescent River Port Pilots' Association, pers comm). Creation of a Carrollton stage versus Belle Chasse discharge rating curve was used to calculate the Mississippi River discharge at which potential hazardous navigational effects were noted (Figure 6). Given that the average percentage of discharge diverted through Neptune Pass can range from 14.5% - 20% of the river's flow, the discharge through Neptune during potentially hazardous navigation conditions was calculated. Note, this is a conservative value for several reasons: 9' was chosen as the Carrolton river stage threshold (i.e., lowest likely stage to cause effects); 14.5% was chosen as the percent flow diverted through Neptune (i.e., lowest likely percentage to cause effects), and the Belle Chasse discharge is an overestimate for that reaching the Neptune Pass reach because of flow loss through Mardi Gras Pass, Ostrica, and overbank flow occurring between the end of the LMR&T levee and the model inlet. Furthermore, a safety factor of 0.9 was applied to the calculated discharge. The chosen maximum allotted Neptune Pass discharge is 80,000 cfs occurring under a Mississippi River discharge of 1 million cfs just upstream of Neptune.

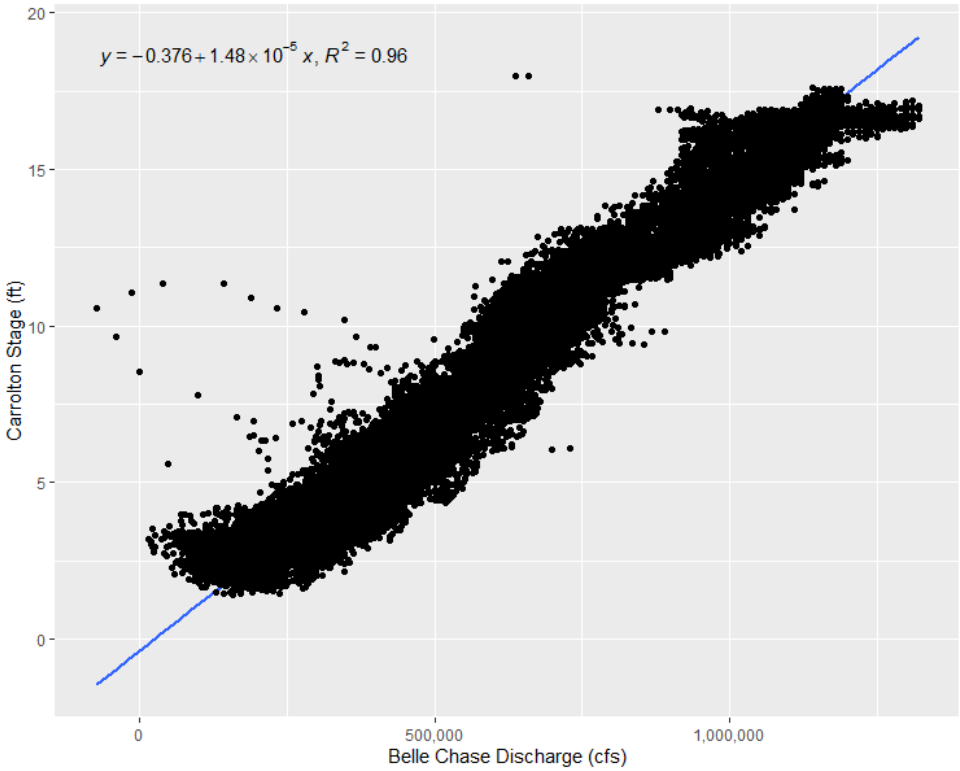


Figure 6. Belle Chasse Discharge - Carrolton Stage Rating Curve. Belle Chasse discharge collected by USGS and Mississippi River stage at the Carrolton gage collected by USACE were used to create a rating curve. This curve was used to determine the river flow at which navigational hazards are present near Neptune and to choose a maximum allotted discharge through Neptune Pass.

Table 2. Maximum Allotted Discharge through Neptune.

Carrolton Stage (ft)	Belle Chasse Discharge (cfs)	Neptune Discharge (cfs, 14.5%)	Safety Factor	Maximum Neptune Discharge (cfs)
9	633,513	91,859	0.9	80,000

Neptune Control Structure Preliminary Analysis

Formerly Proposed Structure

The formerly proposed structure included a stone sill near the middle of Neptune Pass built to +5 feet NAVD88 with a 100-foot notch constructed to -10 feet NAVD88 in the center to allow for sediment, water, aquatic species, and small vessels to pass through (USACE, 2022). The performance of this structure was analyzed under the previously described steady-state scenarios. The findings presented include output from the 800,000 cfs simulation and suggest that the structure would significantly reduce the flow diverted through Neptune Pass but would induce hydraulic conditions that could result in flanking of the structure and/or additional marsh scour.

Figure 7 shows velocity magnitudes and patterns in the Mississippi River at the inlet of Neptune Pass with and without the structure. Velocities are reduced within the pass by 3 – 8 ft/s and within the river

near the opening by 0.5 – 3 ft/s due to the structure. Velocity vectors are more parallel to the river, reducing the drawdown effect reported by pilots.

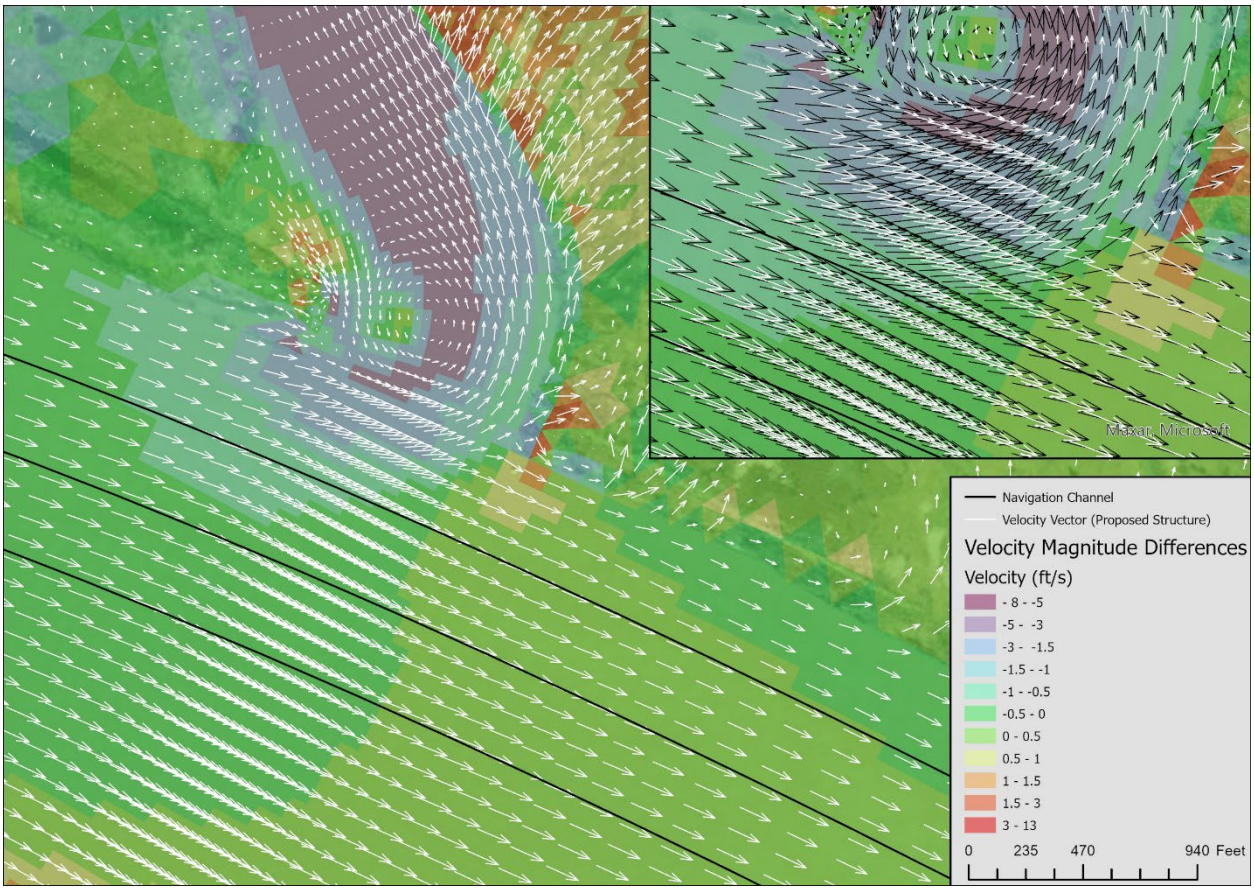


Figure 7. Velocity Patterns at the Inlet of Neptune Pass, evaluated for the Formerly Proposed Structure. The vectors on the velocity map depict velocities with the structure in place (white vectors) and velocities without the structure in place (black vectors). The color contours show differences in velocity magnitude between current conditions and conditions with the proposed structure (with structure minus without structure). Navigational hazards are clearly reduced with the structure in place as the velocity vector directions are more parallel to the river compared to the velocity directions angled into the pass for the without structure conditions. The structure causes reduced velocity magnitudes in and near the pass inlet, shown by the blue/purple colors in the difference map.

Under high-flow scenarios, the sill-notch structure restricted flow through the pass so much that a significant water surface elevation difference across the structure was created (Figure 8). The water surface elevations upstream of the sill ranged from 4 – 4.5 ft, while just downstream of the sill the water surface elevations ranged from nearly 0 ft at the notch outlet and 0.5 – 1 ft elsewhere, creating a 4-foot head difference across the structure. The results waterfall-like conditions and forms a hydraulic jump at the notch outlet. The water level gradient extends across the neighboring marsh system, resulting in the acceleration of overbank flow around the structure and an increase in discharge into Ostrica Pass.

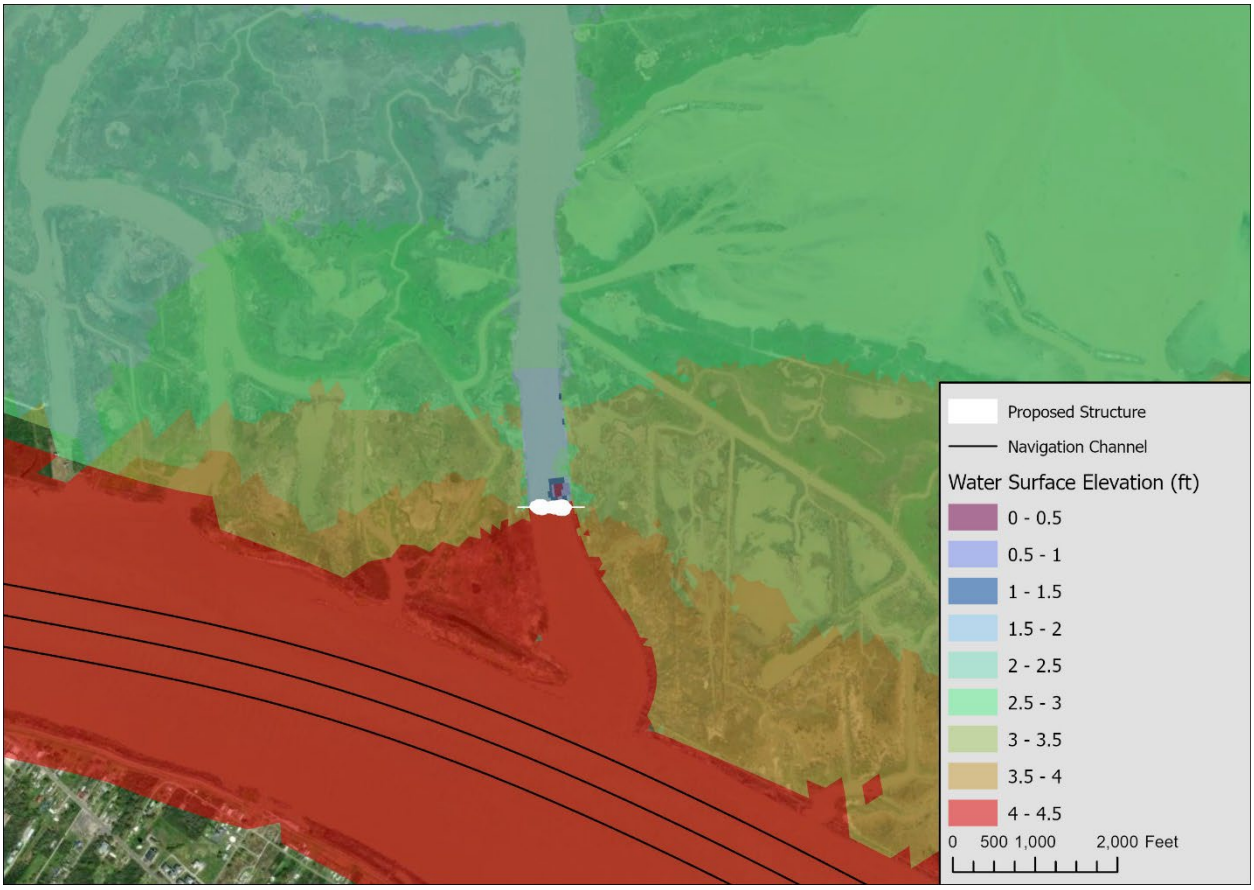


Figure 8. Water Surface Elevations under Formerly Proposed Structure. Water surface elevations upstream of the structure range from 4 – 4.5 ft (red), representing the dam-like state created by the flow restriction. Downstream of the structure notch, water levels are near 0 ft. The water level gradients across the marsh suggest flow is routed over the marsh around the structure.

The increased head differential creates jet-like flows through the notch and scouring downstream. Increased upstream water levels, restricted by the high sill, spill into the neighboring marsh, flanking the structure (Figure 9). Velocities within the notch were the highest, ranging from 10 – 20 ft/s. Accelerated velocities continued downstream, producing scouring velocities on both banks and a recirculation zone. Patterns show velocity magnitudes of 4 – 6 ft/s flowing around the structure over the neighboring marshes and back into Neptune pass. Velocity directions were reversed in Bay Denesse (relative to without structure conditions) with flow directed from Bay Denesse into Neptune Pass. The increased water surface elevation in the river resulted in increased discharge into Ostrica Pass, increasing velocities throughout. Continued stress under this high-flow scenario could lead to increased marsh scour, pass enlargement, and potential failure of the structure via flanking, further increasing the flow diverted through Neptune Pass.

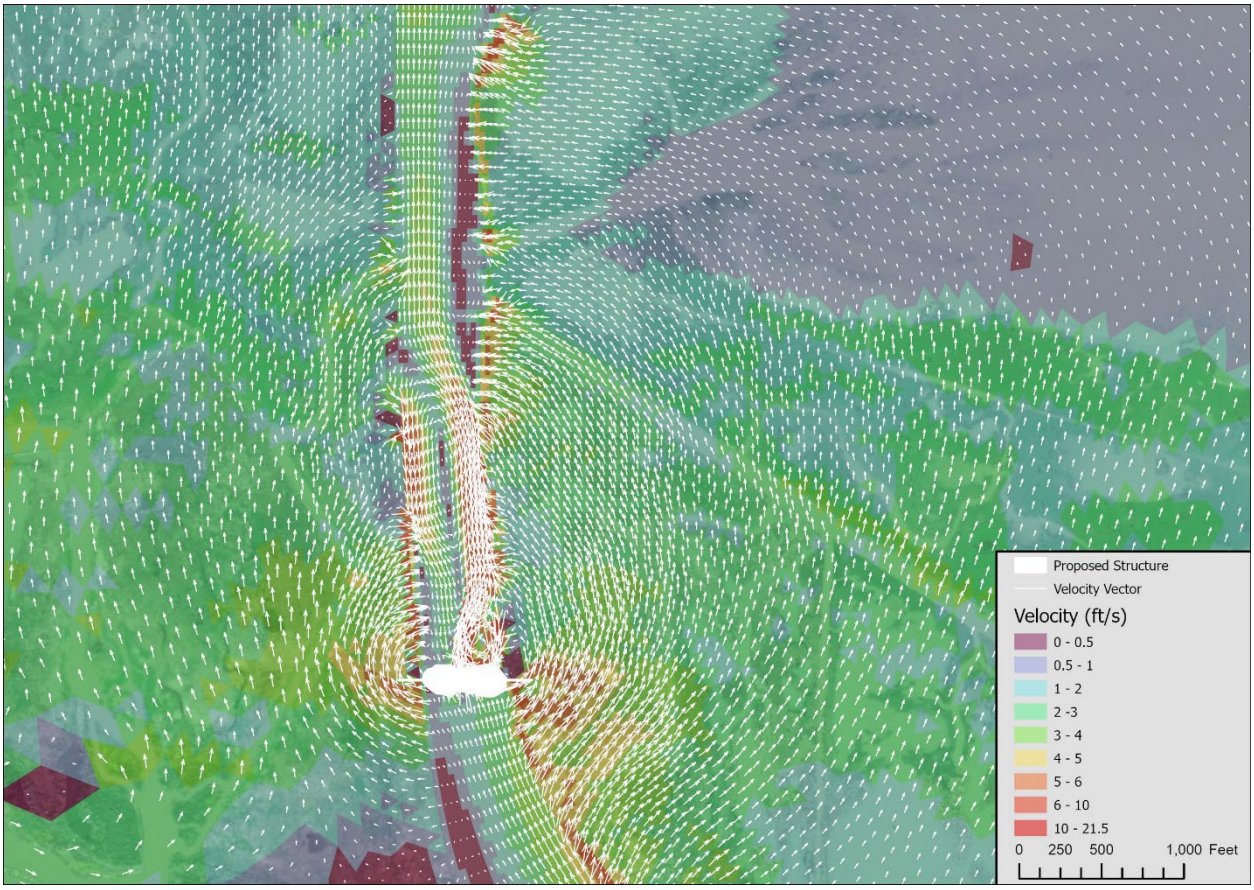


Figure 9. Velocity Patterns throughout Neptune Pass under Formerly Proposed Structure. Velocity patterns show overbank flow upstream of the structure (white polygon) and flanking around the structure, indicated by orange/red mapped velocity magnitudes and white directional arrows. Extremely high velocities are visible through the structure notch and directional arrows show recirculation patterns downstream of the structure. Velocities that currently flow from Neptune pass into Bay Denesse are reversed due to structure placement and directional arrows show flow from Bay Denesse into Neptune Pass.

The potential for flanking and marsh erosion associated with the Formerly Proposed Structure rendered its implementation infeasible. Therefore, a redesign of the solution was initiated. Designs were initially analyzed for their ability to reduce the discharge diverted through Neptune to the desired maximum design flow, their effect on neighboring marsh flows, and then for their capacity to divert sediment. Over 30 structure design alternatives were included in the preliminary analysis. Simulations were completed to determine the optimal location of a sill structure by modeling the sill at various intervals along the pass. To test the sensitivity of the sill height, simulations included sill heights ranging from -10 m NAVD88 to 1 m NAVD88. To test the sensitivity of the notch geometry, several simulations varied notch height and width.

In addition to sill designs, the use of SREDS were analyzed. These SREDS are emergent structures built in the receiving water. They serve two functions: 1) they act as flow obstructions, throttling the flow and reducing the discharge though the pass, and 2) the flow separation in the lee of the SREDS creates conditions suitable for sediment deposition. This accelerates the natural land-building process, associated with the crevasse-play life cycle. Over time, this increased land acreage, close to the Neptune Pass outlet, will serve to further restrict the discharge of the pass, and help to regulate the flow.

To optimize the performance of the SREDs, design variables were modified over several simulations, including their location relative to the outlet of Neptune, their arrangement, and the number of SREDs. Since outputs from the full suite of simulations would be too lengthy to include, the key findings are summarized below.

Effects of Sill Geometry

It was determined through initial analysis that the optimal location for a sill control structure would be at the riverside end of Neptune Pass. This would permit the structure to tie into the existing bank protection along the shore, thereby limiting the likelihood of flanking, at least for structures that do not overly restrict the flow. All analyses presented here assume a sill with varying geometries at the confluence of the Mississippi River and Neptune Pass, as shown in Figure 10 below. To test the effects of sill geometry combined with SREDs, a standard SRED configuration comprising of 3 chevron-shaped SREDs placed at the outlet of Neptune Pass was included (see Figure 10). It is assumed that placing SREDs this close to a high-flow outlet would not be structurally viable (they would be subject to strong erosive forces), but the goal of this initial analysis was to determine the effects of sill geometry, both with and without SRED placement, not to optimize the design characteristics of the SREDS. All analyses show here are outputs from the steady state simulation with an 800,000 cfs Mississippi River discharge.

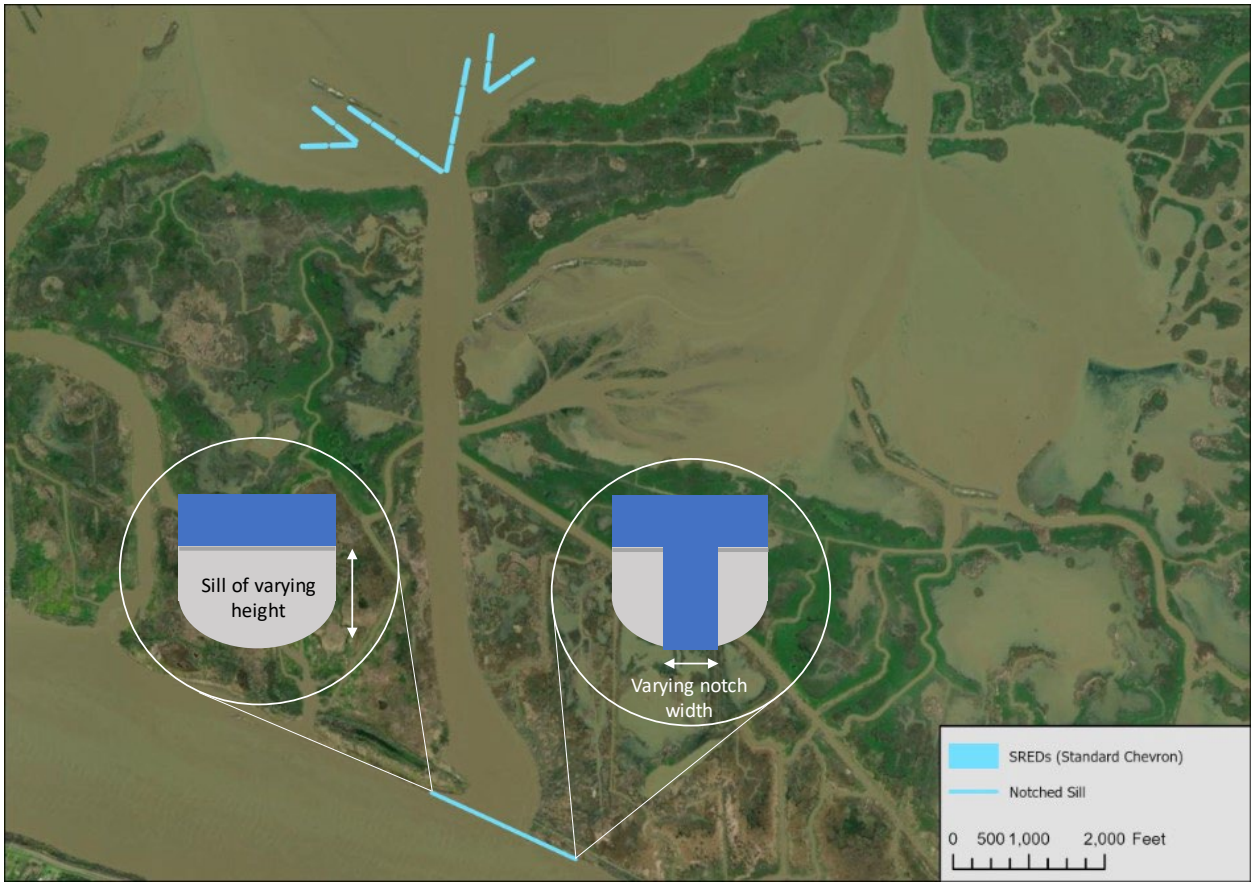


Figure 10. Preliminary Analysis Layout. The initial layout consisted of a sill, with varying geometries, at the confluence of the Mississippi River and Neptune Pass. A "standard chevron" SRED configuration, consisting of 3 chevron-shaped SREDs, was placed close to the outlet of Neptune Pass.

Figure 11 shows results of varying the sill height from -10 m NAVD88 to 1 m NAVD88 (simulations labeled S1-S7) and simulations with a notched sill varying notch widths from 30 m to 150 m (simulations labeled SN1-SN4), both with (orange points) and without (blue points) SREDs. As the hydraulic radius over the sill decreases, either by raising the sill height or decreasing the notch width, flow diverted through Neptune decreases from 125,000 cfs (current conditions) to 0 cfs at full pass closure. Significant reduction in diverted flow due to sill placement does not occur until S6-S7, which represent a sill height from 0 – 1 m NAVD88, essentially full closure.

Figure 11 also shows the effect of SREDs on flow reduction through the pass. The simulation labeled SC (standard chevron) is the output from only including the standard SRED layout and no sill structure. It shows that the effect of placing only SREDs at the outlet of Neptune Pass reduces the flow from the current 125,000 cfs to 80,000 cfs, a 33% reduction in flow. Similar flow reductions by sill placement would require a sill built to -1 m NAVD88. It is clear from this graph that sill placement alone cannot reduce the flow in Neptune Pass to required thresholds without full or nearly full closure of the pass. Furthermore, it shows that the placement of SREDs in the backbay is significantly more effective at reducing flows through Neptune, thereby reducing riverside navigational hazards.

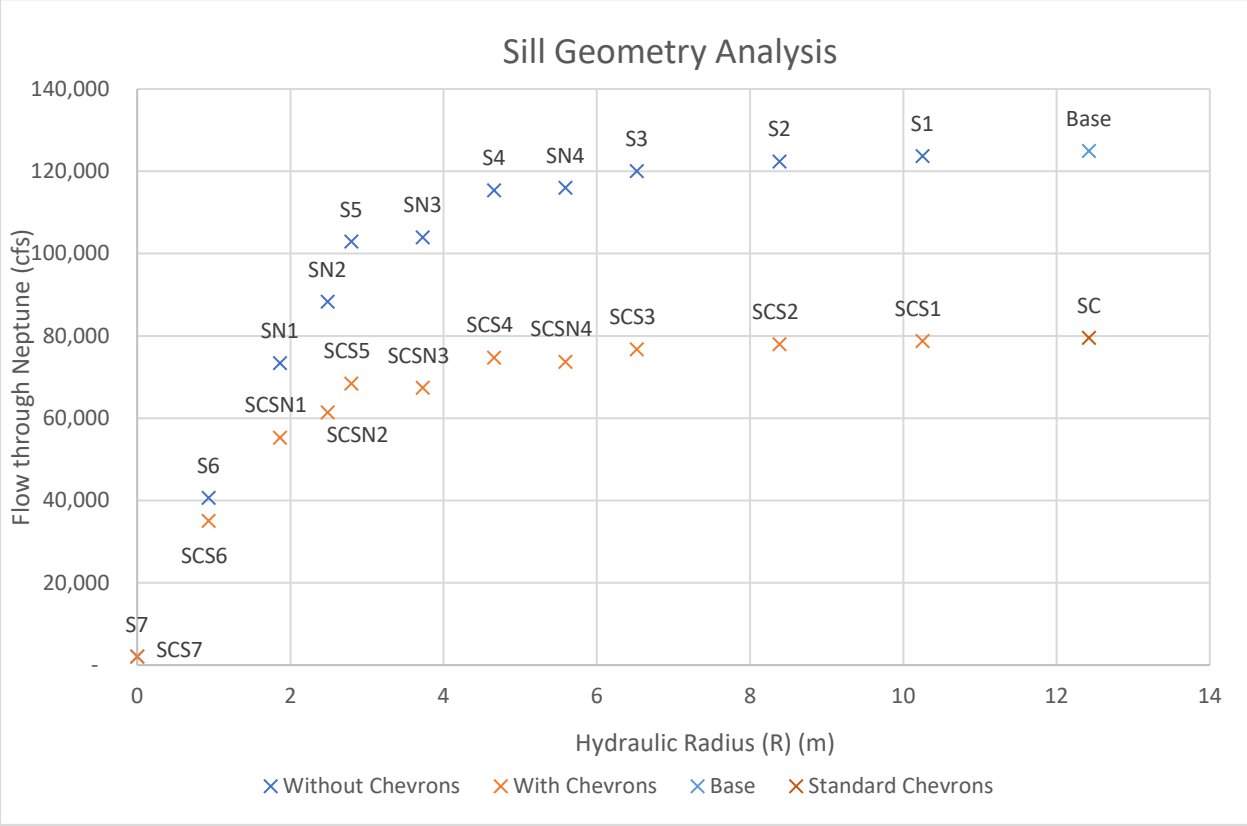


Figure 11. Hydraulic Efficiency of Sill Geometries. The graph above shows the ability of a control sill with varying geometries to reduce flow diverted through Neptune Pass, with (orange points) and without (blue points) SREDs. Sill geometry is represented by its hydraulic radius, where a decrease in hydraulic radius is due to an increase in sill height or a decrease in notch width. Those labeled S1-S1 include a sill only geometry; those labeled SN1-SN4 include a notched sill geometry; those beginning with SC include the standard chevron SRED configuration with sill geometries identified by the end of their name.

After analyzing the flow characteristics of various geometries, the sediment transport efficiency of each structure was investigated. The goal of this analysis was to determine if certain geometries would be

more optimal in transporting sediment while still reducing the flow to chosen threshold values. To analyze the sediment transport performance of each structure, the sediment to water ratio (SWR), an indicator previously used in analyses of the Lower Mississippi River sediment diversions, was utilized (Meselhe et al. 2012). A large SWR in the equation below indicates maximization of the ratio of sediment load to water extracted through the pass and minimizes the potential of downstream shoaling in the river.

$$SWR = \frac{Sand\ Load\ Diverted/Sand\ Load\ in\ the\ River}{Water\ Discharge\ Diverted/Water\ Discharge\ in\ the\ River}$$

A higher value of SWR indicates more optimal structure sediment transport and less shoaling downstream. A SWR value of 1 would represent equal ratios of sand transport in the river and pass, a SWR higher than 1 indicates a richer sediment concentration in the diversion than in the river (optimal for reducing riverside shoaling), and a SWR value near 0 is less desirable, sediment-lean water. For example, the current condition (Base) extracts 16.4% of the main river discharge, 10.5% of the river sand load, and 16% of the river fines load, resulting in SWR values of 0.6014 (sand) and 0.976 (silt). Figure 12 shows the outputs of the sediment transport analysis. This analysis is qualitative in nature due to model sediment transport parameterization, and ratios should not be inferred as exact values but as a change in performance from the current (base) conditions. Since previous analyses prove the effect of SREDs were significantly greater than the flow reduction by a sill structure alone, only sill geometries including SREDs placement will be presented below.

As would be expected, the transport efficiency of sand (blue points) decreases as the sill height is increased. The SRED configuration alone (Simulation “SC”) decreases the sandy sediment passing through Neptune by 35% compared to base conditions. Placement of the least constrictive sill (Simulation “SCS1”) decreases the sediment passage by 63%. Subsequent increases in sill height further decrease the SWR, but reduction increments are smaller. There is a spike in the SWR (Simulation “SCS6”) just before full closure of the pass (Simulation “SCS7”). This is likely caused by the increase in the SWR numerator due to significantly reduced flow diverted through the pass and only slight decrease in sand load; it is not an indicator of a more optimal structure. The notched sill geometry results in higher sand passage than non-notched sill geometries, indicated by the higher SWR values. The most constrictive notch (Simulation “SCSN1”) at 30 m wide performs better than the least constrictive sill (Simulation “SCS1”). Notch inclusion in the sill geometry allows for a deeper opening and maximizes the capture of sediment throughout the water column, specifically sand particles which are more concentrated at higher depths.

The sediment transport efficiency of fine sediments (orange points) was quantified in the same manner. There is little change in the transport of fine sediment across structure geometries. Most values of SWR range from 0.97 – 0.94, a negligible decrease from base conditions. Fine sediments are suspended throughout the water column and are easier to divert than sand particles.

The key takeaway from this analysis is that the sill can be constructed to reduce flows to required values, while maximizing sediment transport efficiency using a notched sill approach. This will not only increase the likelihood of continued marsh growth in the receiving bays, but also decrease potential shoaling in the river downstream. Furthermore, increased deposition in the receiving bays and behind constructed SREDs further decreases the future flow capacity of the pass and associated navigational hazards.

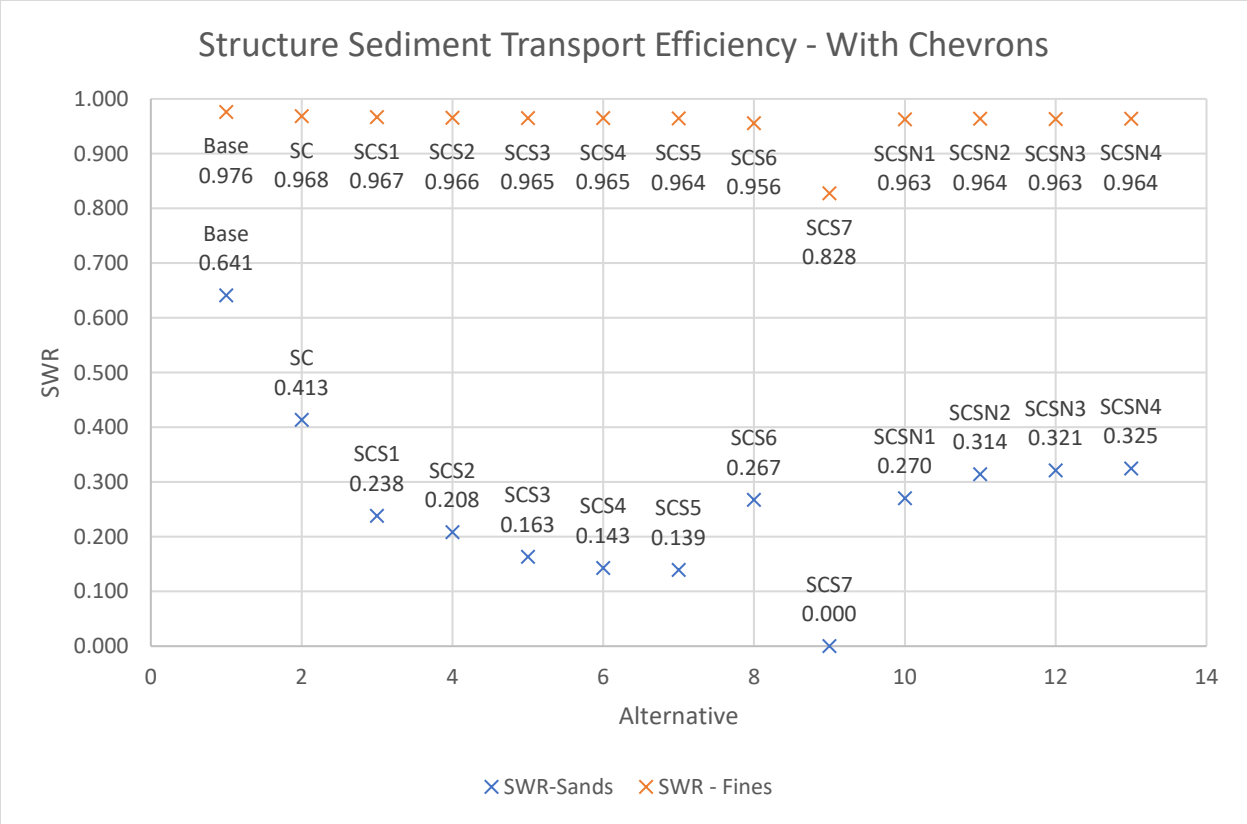


Figure 12. Sediment Transport Efficiency of Sill Geometries. The SWR was used to qualitatively assess the sediment transport efficiency of various sill geometries compared to base conditions. Sill geometry has little effect on fine sediment transport (orange points). Sill height inversely effects the sediment transport efficiency of sand. Sills with a notched geometry are more optimal for sediment transport across the structure.

SRED Sensitivity

The effects of SRED location, quantity, and configuration on flow reduction was analyzed across multiple simulations. The "standard chevron" SRED (i.e., a triangle-shaped feature with the closed end pointed toward the Neptune Pass outlet) was used to test the effects of the SRED proximity to the outlet of Neptune by shifting the array of SREDS bayward 50, 100, and 200 m. The quantity of SREDs was analyzed by designing a configuration of multi-tiered chevron shaped SREDs. A primary row of SREDs were placed at the outlet and a secondary row of SREDs was placed behind the first in between openings. This design imitates the natural formation of a delta with primary and secondary bifurcations as the gaps between SREDS and the lobes as the SREDs themselves. Finally, the last configuration a realistic SRED configuration placed at the -10 ft contour in Quarantine Bay. This location was chosen as it is the most feasible for SRED constructability. Figure 13 shows each layout with their respective simulation name.

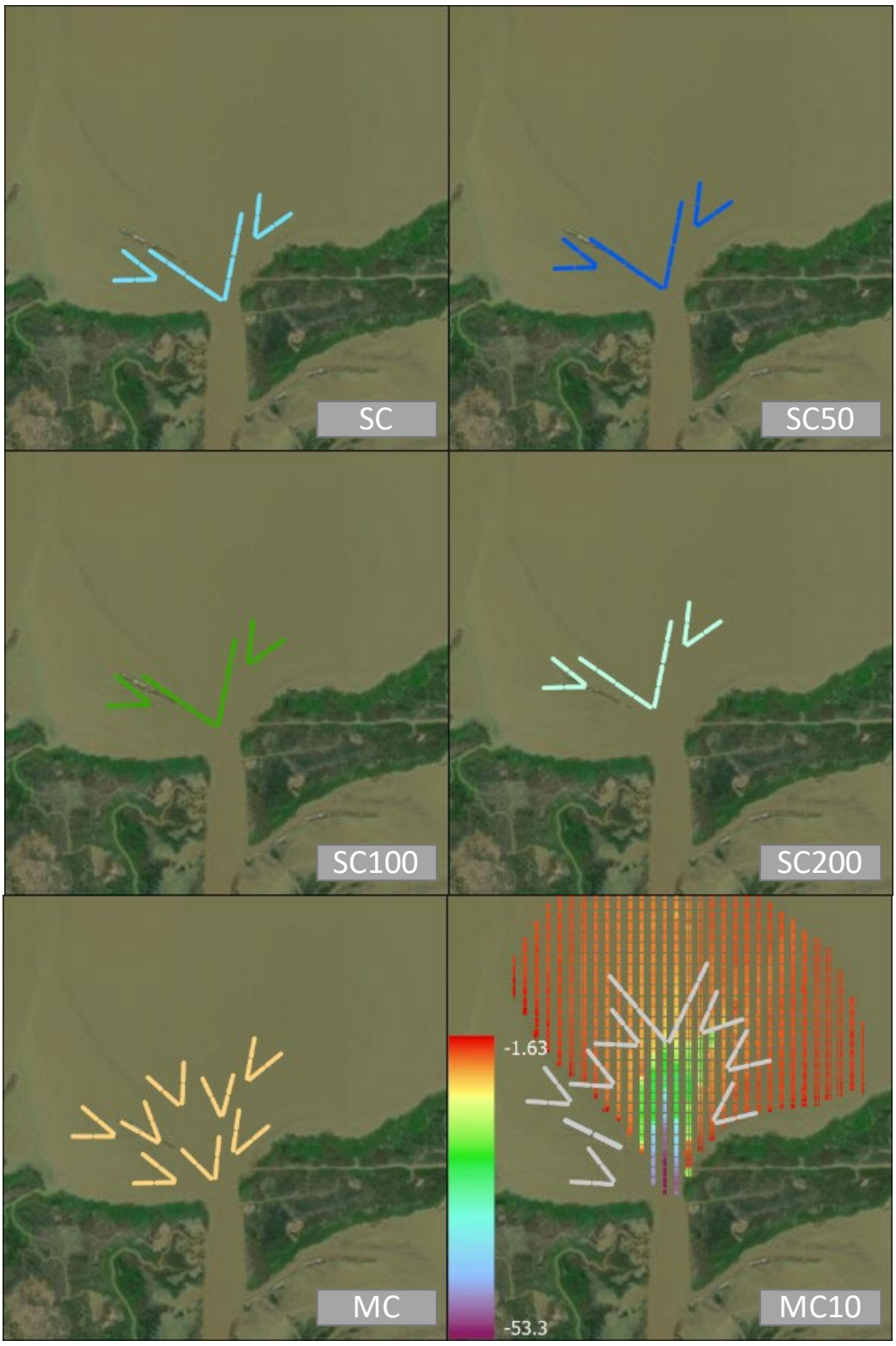


Figure 13. SRED Sensitivity Layouts. The figures above show modeled conceptual SRED layouts and their corresponding simulation name. Configurations were simulated to test the sensitivity of SRED proximity to the Neptune Pass outlet and the number of SREDs constructed.

Figure 14 presents the results of the SRED sensitivity analysis. The percent of flow diverted through Neptune Pass is compared to the current conditions (Base) for each configuration. Shifting the SREDs away from the outlet decreases their ability to reduce the flow through Neptune Pass, with significant decreases in ability in the first shifts and smaller decreases thereafter. The multi-tiered SRED layout performed similarly to the standard SRED layout, even though the individual SREDs were much smaller than the standard layout. The more realistically constructed layout, MC10, reduced the flow by 4.74%. Based on these analyses and construction requirements, a layout similar to MC10 in combination with a notched sill was chosen to be analyzed in the final design.

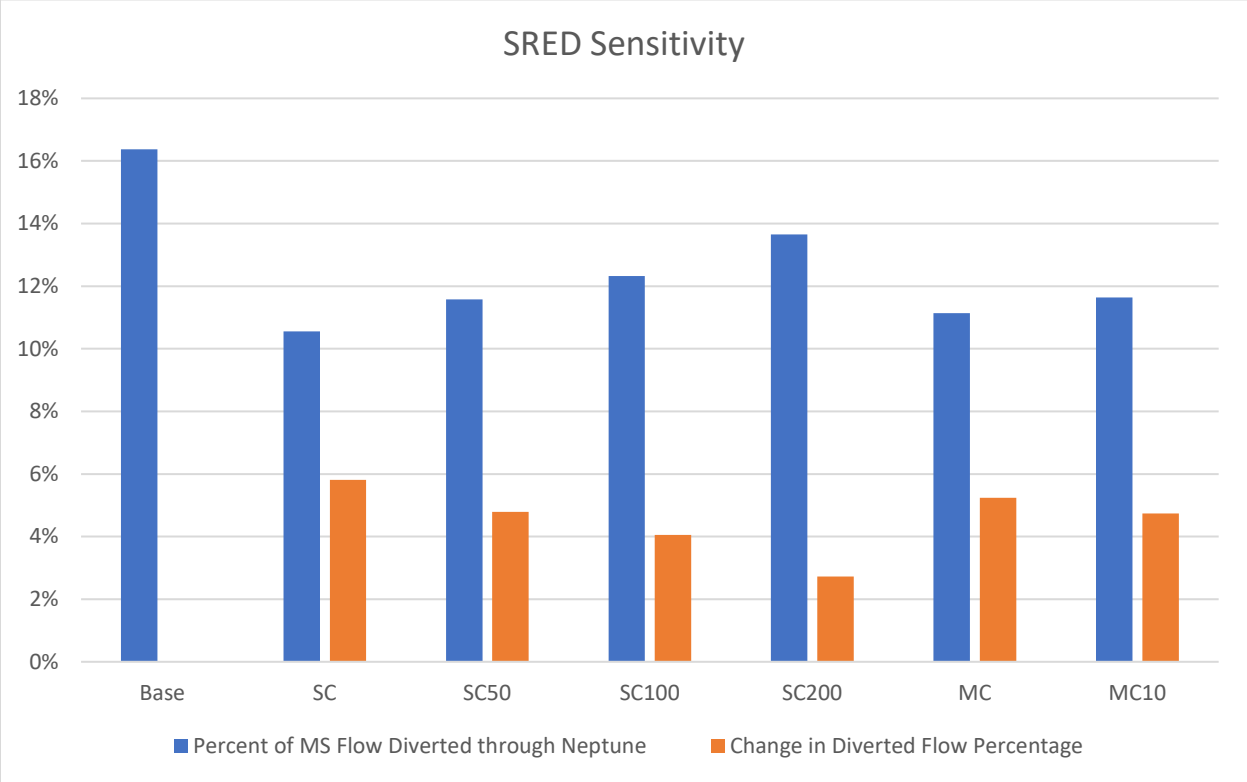


Figure 14. SRED Sensitivity Analysis. The flow reduction through Neptune Pass from base conditions is shown by the orange bar. Shifting the standard chevron SRED configuration away from the outlet decreased their flow reduction efficiency in a non-linear fashion. The multi-tiered approach was able to compensate for this loss.

Recommended Neptune Flow Control Solution Analysis

Based on the preliminary analysis, a control structure consisting of a notched sill at the confluence of the Mississippi River and Neptune Pass coupled with a multi-tiered chevron-shaped SRED layout was deemed the most optimal. The final analysis consisted of tuning the notch size, sill height, and SRED layout to effectively reduce the flow to the chosen maximum discharge. The proposed final layout shown in Figure 15 is recommended as the optimal control structure layout. The sill is constructed using a stepped notch design, where the notch is built to -26 ft NAVD88, the interior stepped sill is built to -8 ft NAVD88, and the exterior sill extends to the bankline at +5 ft NAVD88. Exact dimensioning of the sill and SREDs will be directed by Civil design, as detailed features, such as side slopes, are not resolved in the hydraulic model and will be dictated by stability analyses.

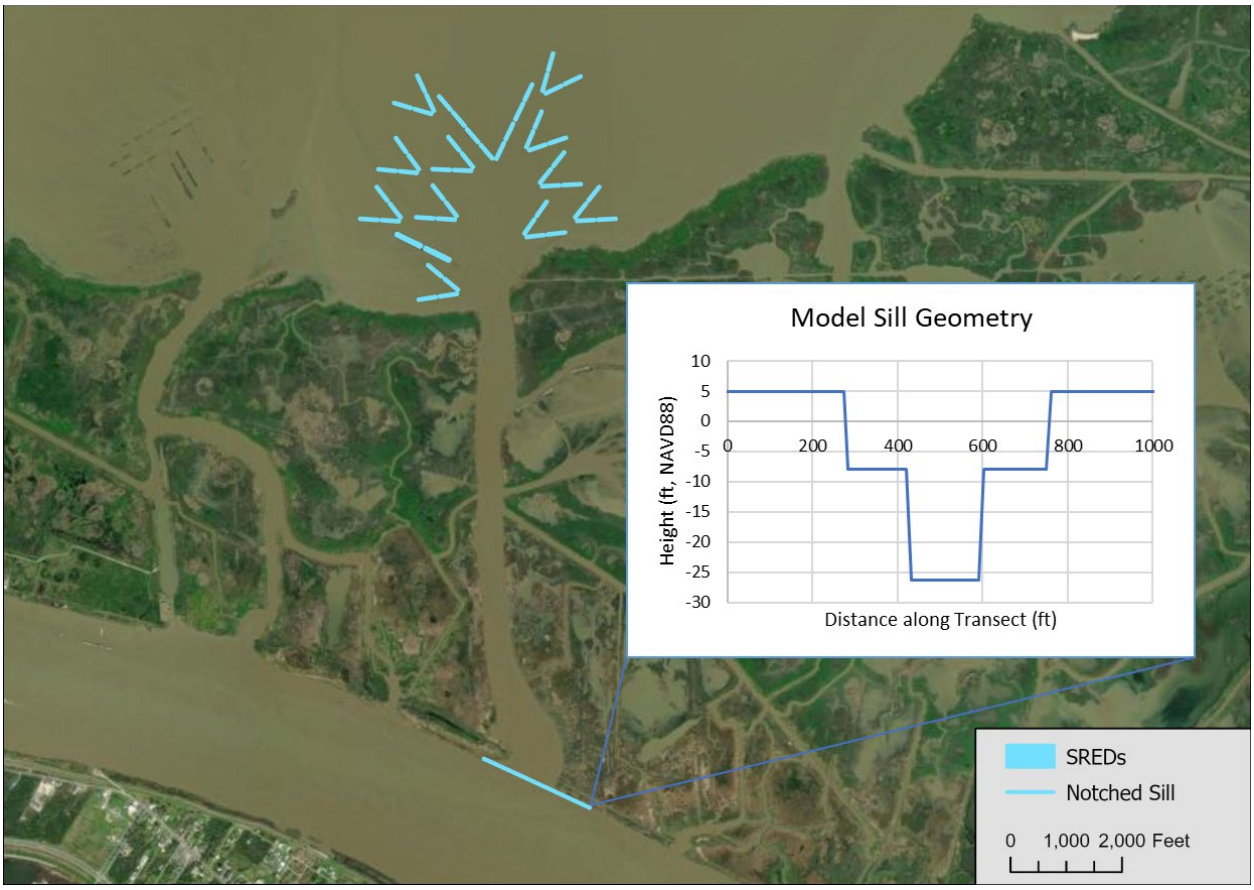


Figure 15. Recommended Control Structure Design. The proposed layout was chosen as the optimal Neptune control structure configuration through multiple preliminary analyses and fine tuning for required discharge thresholds. It consists of a stepped notched sill at the confluence of the Mississippi River and Neptune. The modeled final sill-cross-section is shown in the nested graph. The SRED configuration consists of 12 chevron-shaped SREDs and one (existing) linear SRED. Actual detailed structure dimensions and locations will depend on Civil design.

Flow Diverted

The main goal of this study is to reduce the discharge diverted through Neptune to the design maximum of 80,000 cfs at a Mississippi River discharge upstream of Neptune of 1 million cfs, while limiting any negative hydraulic effects to the system. Figure 16 gives the rating curve from model output of flow in the Mississippi River just upstream of Neptune and associated flow diverted through Neptune under the recommended control structure. The dotted lines account for +/-10% in uncertainties. The model predicts flow through Neptune is slightly higher than 80,000 cfs under 1,000,000 cfs in the river. After discussion this was deemed acceptable for multiple reasons, including model uncertainty and multiple safety factors used when choosing the maximum discharge.

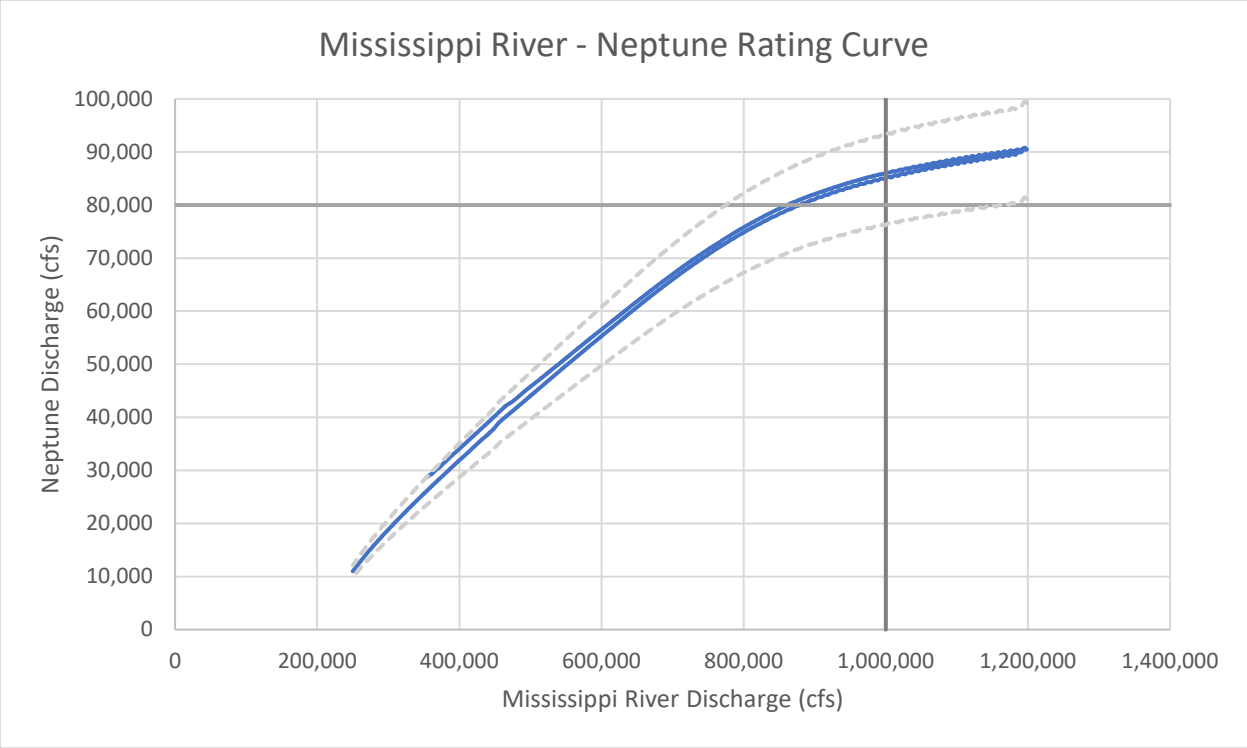


Figure 16. Recommended Control Structure Rating Curve. The curve represents model predictions of discharge through Neptune under a range of Mississippi River discharges.

A maximum flood of 1 million just upstream of Neptune Pass is a conservative discharge. Due to the un-leveed left descending banks downstream of Bohemia and the existence of multiple flow routes into the eastern low-lying marsh system, overbank flooding at a flow of anything higher than 800,000 cfs in the lower river will drain the system. The flatter slope in Figure 16 hints at this as discharge through Neptune begin to drop off after 800,000 cfs. Simulating a maximum flood of 1 million cfs in the lower river is an appropriate indicator for achieving the required maximum diverted flow through Neptune, but not representative of average structure performance. For this reason, full hydraulic analyses will be presented on the system when the river upstream of Neptune is near 750,000 cfs. This is a typical high flow that the structure will be subjected to frequently and most useful for hydraulic performance of the structure. Model output maps at maximum flood were analyzed for any potentially hazardous flows but will not be presented.

Water Surface Elevation

Figure 17 presents the water surface elevation (WSE) map predicted by the model under the recommended control structure using a MSR discharge of 750,000 cfs just upstream of Neptune Pass. The smooth change in colors suggest no sudden increases or drops in WSE across the structure. Changes in water level from upstream the sill to downstream are, on average, 0.4 ft. There are no sharp gradients over neighboring marshes that would suggest overbank flow or flanking around the structure.

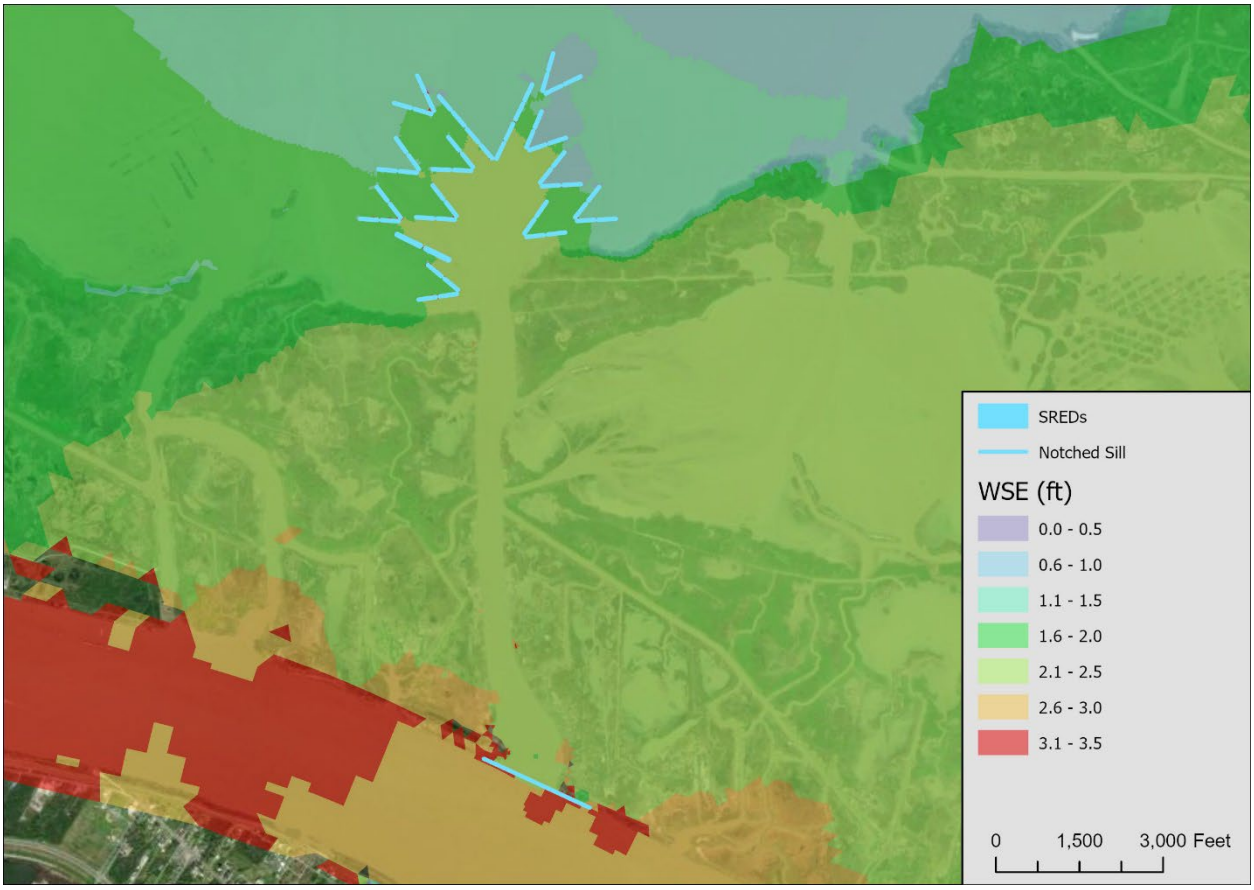


Figure 17. Water Surface Elevation Map under Recommended Control Structure. The map shows the model predicted WSE near Neptune Pass due to the recommended control structure for a Mississippi River Discharge of 750,000 cfs just upstream. There is a slight gradient in WSE at the sill structure and again near the SREDs. At the sill structure, the change in WSE from upstream to downstream is on average 0.4 ft.

To further analyze the effect of the recommended control structure on WSE, the difference between WSE map outputs with and without the structure was compared. Figure 18 presents the difference map, again at a MSR discharge of 750,000 cfs just upstream of Neptune Pass. WSE changes due to structure placement are relatively low – between -1 and +1 ft for the entire domain. The most notable changes include a decrease in WSE just downstream of the constructed sill likely due to increased velocities and decreased overall flow allowed through the notched sill structure. There is a general increase in WSE throughout Neptune Pass, as the SREDs reduce pass capacity and create a backwater effect upstream. There is another decrease in WSE downstream of the SREDs. There is a general increase in WSE throughout the MSR just upstream and downstream of Neptune due to the structures ability to maintain water within the river. Interestingly, there is a greater increase in WSE in the MSR upstream of Neptune than downstream. This trend is linked to velocity changes occurring in the river and is expanded upon later.

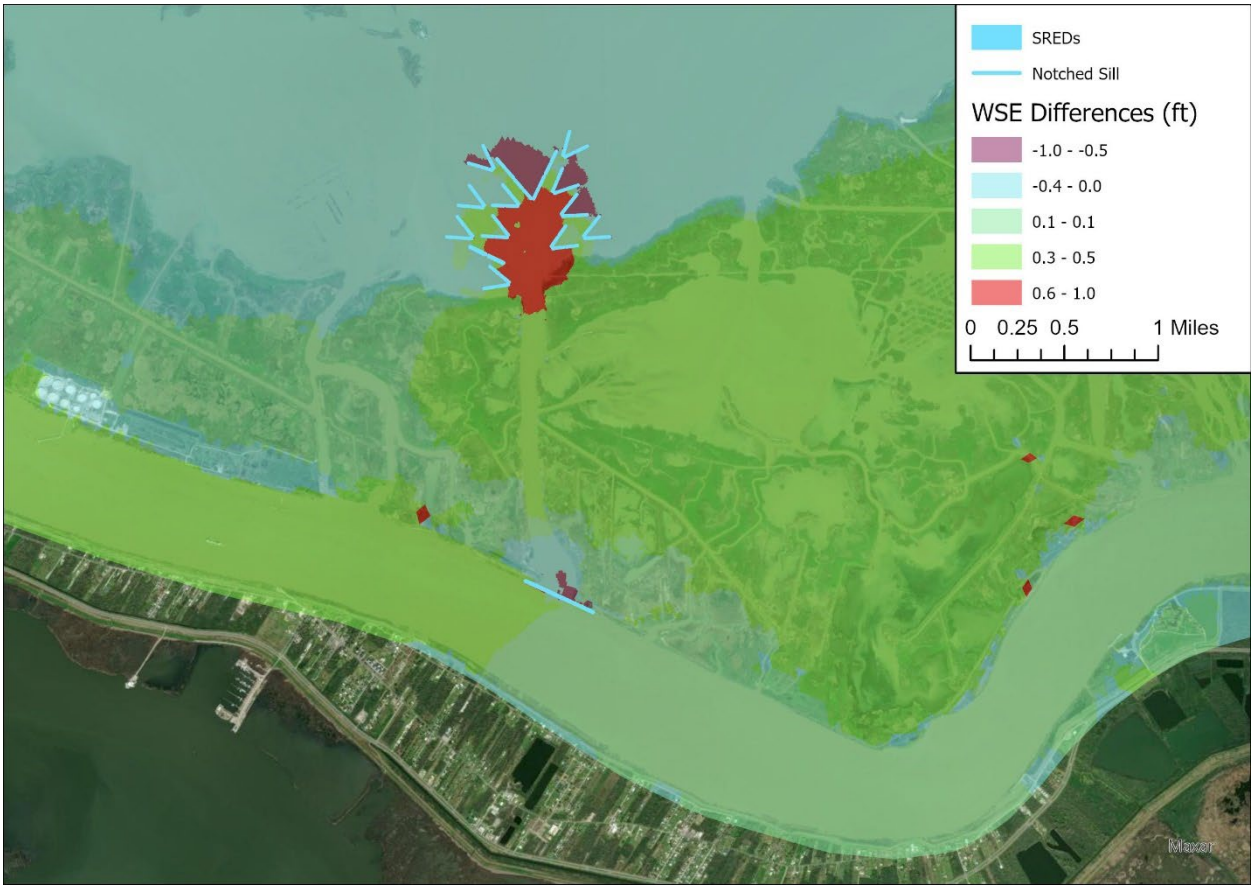


Figure 18. Water Surface Elevation Difference Map. The map shows WSE differences when comparing the current without project conditions to the with project conditions. The most notable changes occur just downstream of the sill and near SREDs. Generally, the WSE is raised throughout Neptune Pass due to SRED placement. WSE in the river are higher under structure placement due to maintained river flow. WSE differences in the river upstream of Neptune Pass is slightly higher than downstream changes.

Velocity

Velocity vectors under structure placement were analyzed for potential high velocity areas, directional patterns and magnitudes of velocities through Neptune and connecting channels, and velocity directional changes in the river at the inlet of Neptune Pass (Figure 19). The highest velocities occur in the notch of the sill and through SRED gaps. At the notched sill, velocities reach 8 – 12 ft/s. The reduced areas through SRED gaps create increased velocities throughout ranging from 4-10 ft/s. The highest velocities throughout the SRED configuration tend to occur near the downstream end of SRED gaps, while velocities behind the SREDs are near 0. The slower velocities and recirculation patterns behind SREDs will encourage sediment deposition in those areas. Conversely, high velocities near the edges of individual SREDs will promote erosion. Velocity patterns throughout Neptune are streamlined and maintained within the pass, suggesting little overbank flooding or marsh scour potential.

There is a clear increase in the flow connection between Neptune Pass and Bay Denesse, suggested by higher velocity at their connection and the connection between Bay Denesse and Quarantine Bay. There is also clear increase in the hydraulic connection between the river, Ostrica, and Quarantine Bay, indicated by streamlined velocity vectors throughout Ostrica. At the inlet of Neptune Pass, velocity

vectors in the river are parallel with flow throughout the navigation channel under the recommended structure, suggesting alleviation of reported navigational hazards (Figure 20).

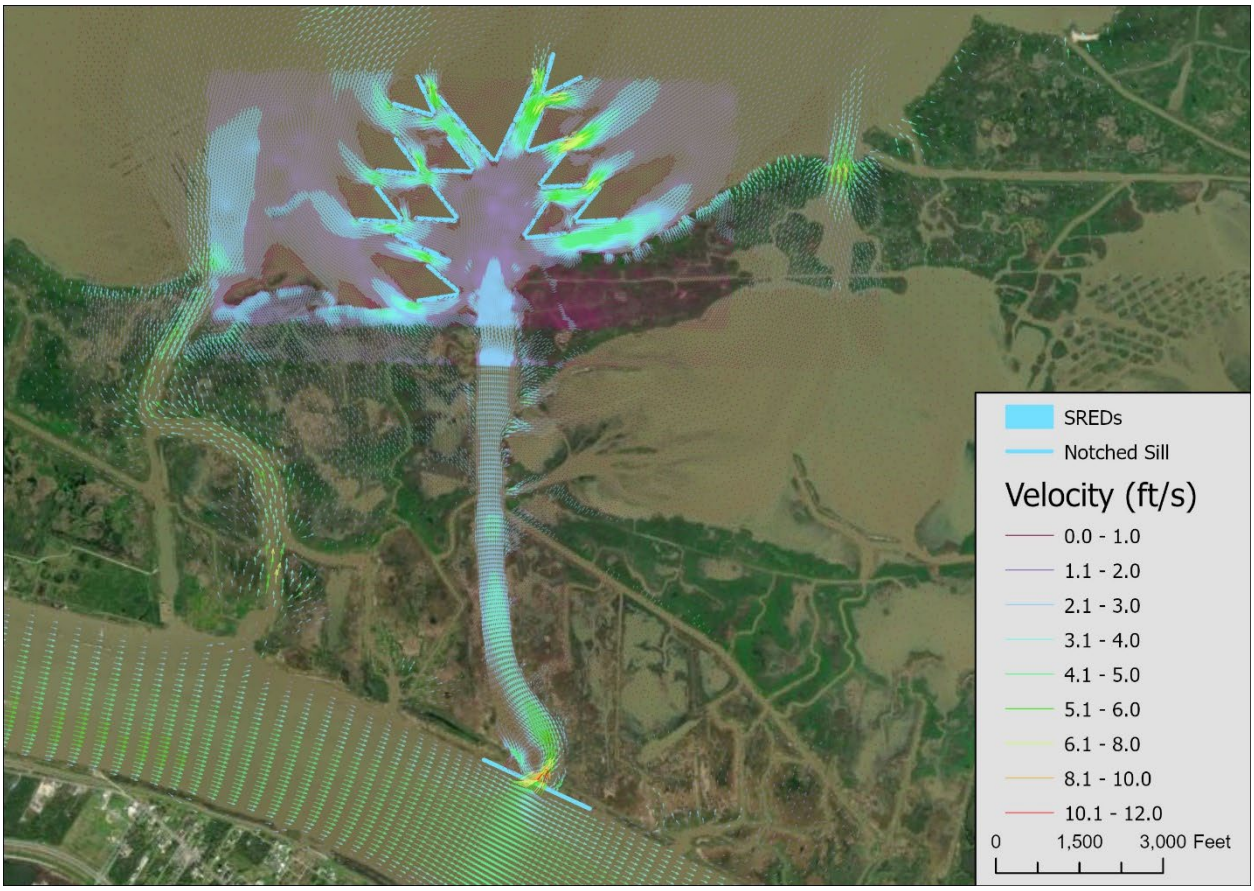


Figure 19. Velocity Vector Map under Recommended Control Structure. The map shows velocity patterns due to control structure placement under a MSR discharge of 750,000 cfs upstream. The highest velocities occur within the notch of the sill and between SRED gaps due to reduced flow area. Lower velocities occur within Bay Denesse and behind SREDs, suggesting depositional areas. Generally streamlined velocities through Neptune suggest maintained flow with little to no overbank flooding due to structure placement.

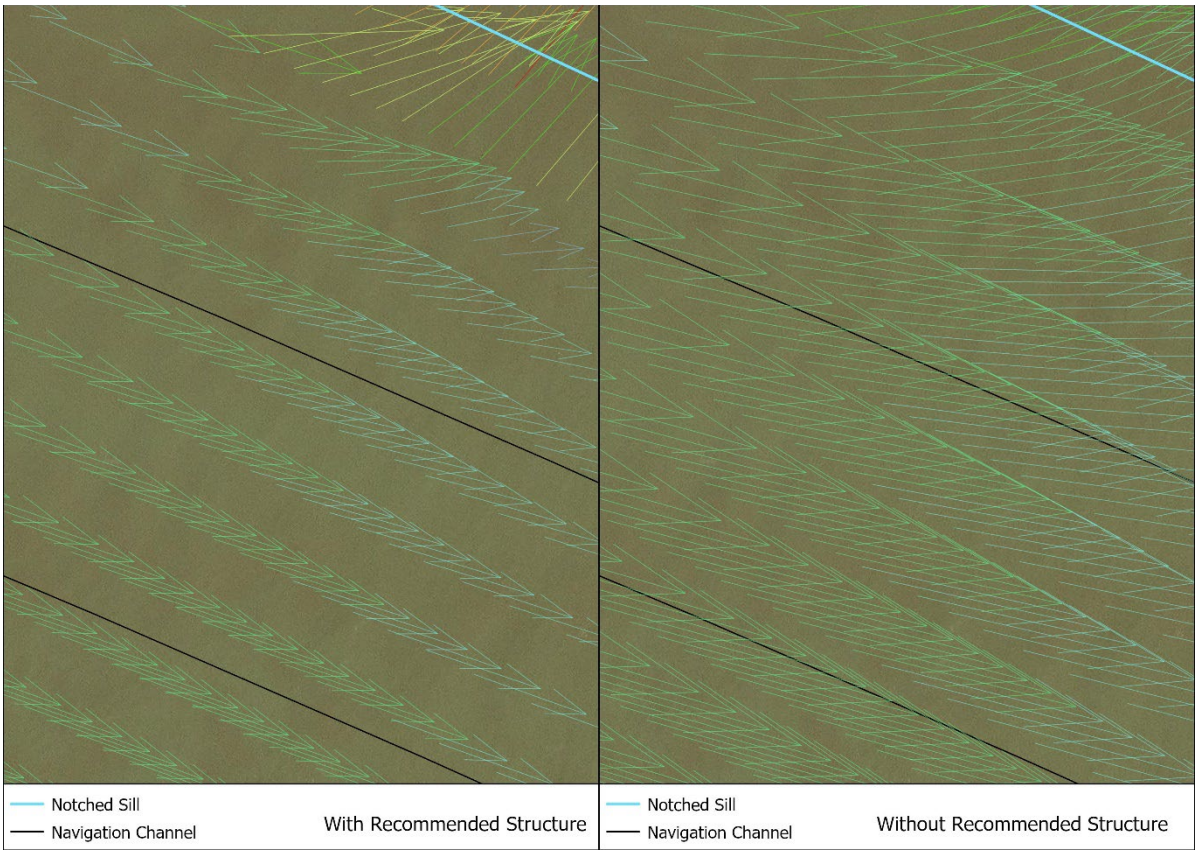


Figure 20. Velocity Vectors at Neptune Pass Inlet. The maps compare velocity vectors in the river at the inlet of Neptune with and without structure placement. The black line is the center and left descending bank-side extents of the navigation line nearest to the inlet. The blue line in the top right corner is the notch section of the sill. With the structure in place, velocities are smaller and more parallel with the navigational channel when compared to the without scenario.

To further analyze the effect of control structure placement, the differences in velocity magnitude with and without project is shown in Figure 21. Velocities through Neptune Pass and behind SREDs show the greatest decrease. Velocities throughout the pass are decreased by 1 – 5 ft/s when compared to current conditions. There is a slight increase just downstream of the sill due to the flow constriction through the notch. However, these increases are relatively small and do not suggest hazardous flow conditions due to structure placement. There are also increases in flow through the gaps between SREDs due to flow constrictions experienced there. There is a slight increase in flows through the channels connecting Neptune Pass and Bay Denesse and the channel connecting Bay Denesse and Quarantine Bay. As the SREDs reduce velocities and raise water levels in the pass, flow is diverted more into Bay Denesse. In fact, the majority of flow loss in Neptune Pass is through this right bank connection and not via left bank flow. This trend suggests an increased connection between the pass and bay and continued marsh emergence throughout.

There is an increase in velocities between the river and Quarantine Bay through Ostrica. The increase in flow maintained in the river due to structure placement puts pressure on neighboring left bank openings. This effect alludes to the underlying processes that drive crevasse formations in the Lower Mississippi River and the reasoning behind recommending SRED placements as the optimal alternative. Any structure that limits the flow from the river into the neighboring bay will create subsequent pressure at another weak point in the bank. This cycle, when combined with decreased sediment input,

marsh erosion, and sea level rise on the bay side, will continue on indefinitely and likely at an increased pace, unless sufficient land is built in the receiving water. SRED placement in the backbay closes the pass through accelerating the natural crevasse closure process, leaving behind an adjacent marsh that is less susceptible to crevasse formations in the future.

Finally, there is an increase in Mississippi River velocities downstream of Neptune, but a slight decrease upstream of Neptune. This phenomenon is directly related to the WSE increases in the river, which suggested greater increases in the river upstream of Neptune Pass. It is intuitive that velocities would increase downstream due to the increase flow maintained within the river. The decrease in velocities experienced upstream is attributed to higher tailwater elevations under the control structure and associated loss in upstream velocity (due to conservation of water mass). This finding is corroborated by a previous HEC-6T study analyzing WSE and sand accretion changes in the LMR due to Neptune Pass. The study finds that with the pass open, velocities upstream of Neptune are increased and the reach is in degradation due to lower tailwater elevations. Velocities downstream of Neptune Pass in the river under a fully open condition are lower and more accretional, requiring dredging (Ronald Copeland, pers comm). Here, reducing the flow diverted by the pass results in similar, conversed trends.

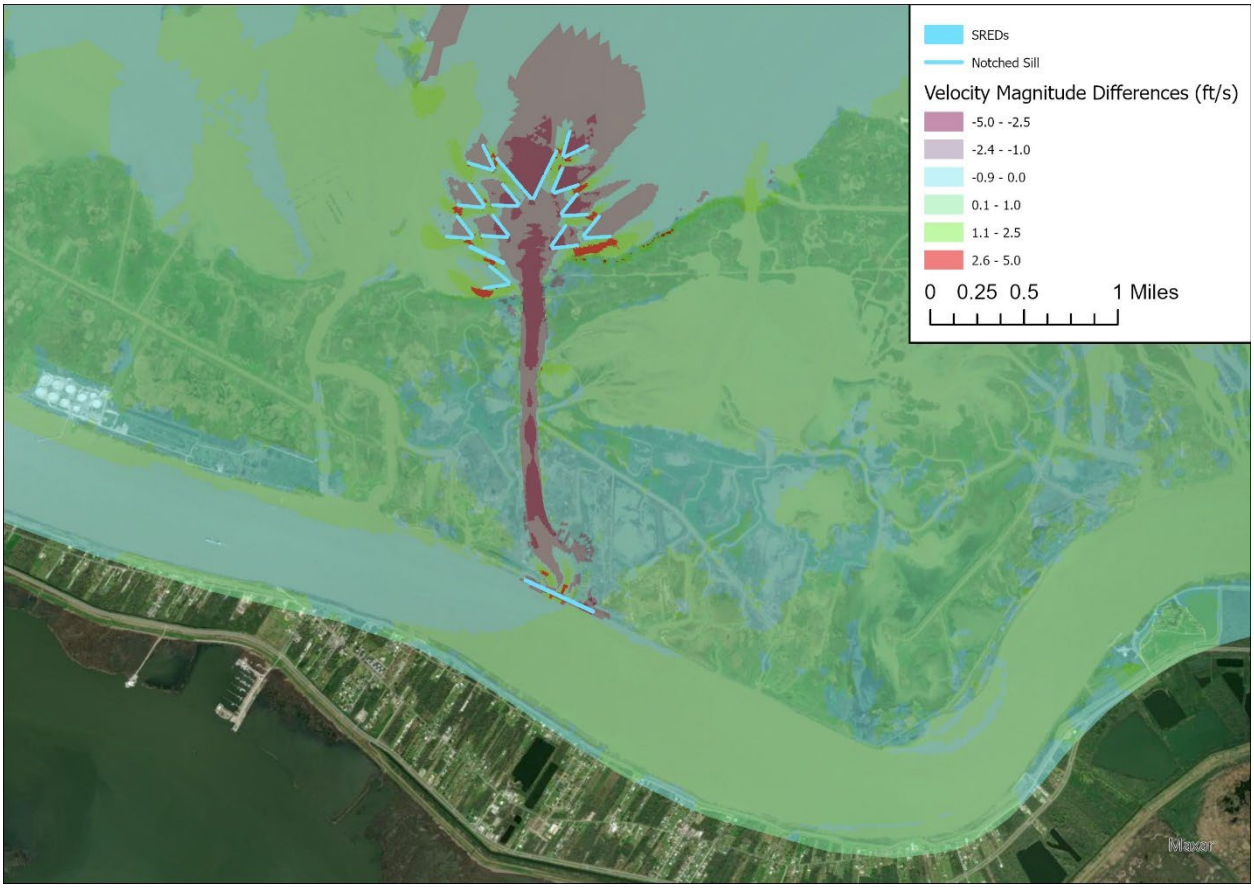


Figure 21. Velocity Magnitude Difference Map. The map shows differences in velocity magnitudes with and without the recommended structure using a discharge of 750,000 cfs just upstream of Neptune. There are generally decreased velocities throughout Neptune Pass and the SRED configuration with a small increase just downstream of the notched sill. The map shows increased hydraulic connectivity between Neptune Pass, Bay Denesse, and Quarantine Bay as well as between the Mississippi River, Ostrica, and Quarantine Bay. There are increased velocities in the river downstream of Neptune Pass due to maintained

flow in the river. Upstream of Neptune Pass, the river experiences a slight decrease in velocities due to higher tailwaters present under the control structure.

Bed Shear Stress

Total bed shear stress, which includes the effects of velocity and water depth, is presented to investigate high shear stress areas that are potentially prone to scour. Total bed shear is greatest in between SRED gaps, suggesting the outer edges of individual SREDs will be most prone to erosion. Increased bed shear between SRED gaps also serves as a sediment source for the low stress, depositional area behind the SREDs. Bed shear throughout the marsh system is near 0, suggesting little overbank flooding or marsh erosion potential due to structure placement. There is increased stress in the connection between Bay Denesse and Quarantine Bay, which is suggestive of the increased connection between Neptune Pass and Bay Denesse. Ostrica experiences shear stress similar to that of Neptune Pass due to its increased connection with the river. Overall, there are no bed shear stress patterns suggestive of potentially hazardous marsh connections formed by control structure placement. Bed shear stress in the notch of the sill and just downstream are elevated due to higher velocities, near 10 – 15 lb/ft/s^2, and should be noted.

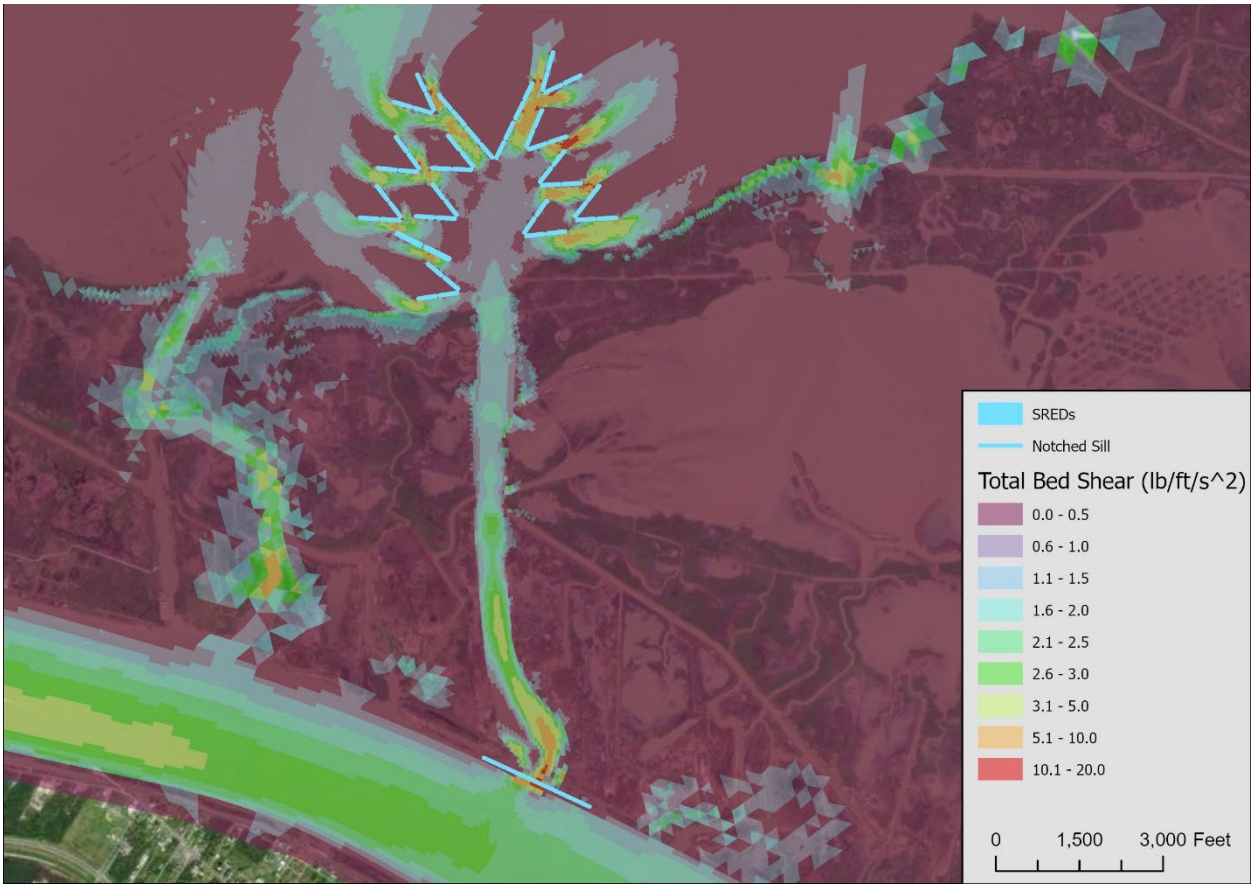


Figure 22. Total Bed Shear Stress under Recommended Control Structure. The map shows total bed shear stress under the recommended control structure for a MSR discharge of 750,000 cfs. Highest shear stresses occur at the notch in the sill structure and within gaps in SREDs. These locations should be noted for potential scour.

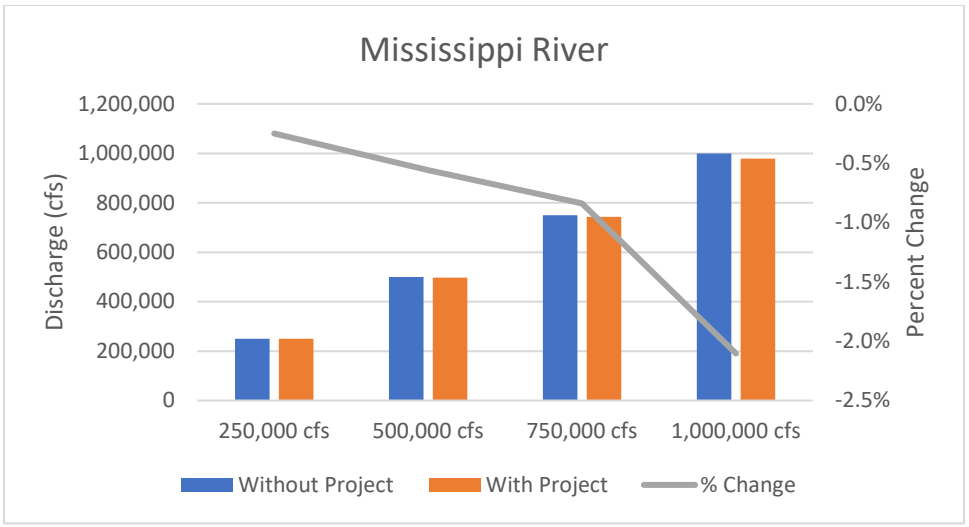
Discharge

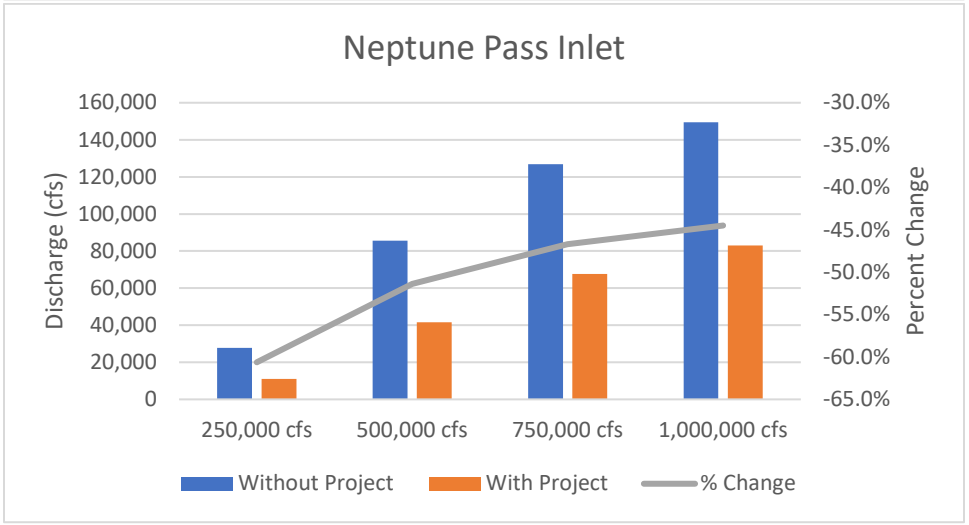
Finally, the changes in discharges across various cross-sections were analyzed to ensure that the hydraulic connectivity of the entire system was not significantly altered under structure placement. Locations for which cross-sectional discharges were analyzed are the Mississippi River upstream of Neptune Pass, the inlet of Neptune Pass in the scour hole, and the inlet of Ostrica. The MSR discharges at which the discharges are presented include 250,000 cfs, 500,000 cfs, 750,000 cfs, and 1,000,000 cfs.

Figure 23 summarizes the analysis. Under the recommended structure conditions, discharge in the Mississippi River upstream of Neptune is less than current conditions by 0.2% – 2.1%. This is due to the increased tailwater effect created by the structure and explained in the previous sections. While the change is relatively small, implications for decreased discharges in the river can include increased aggradation within the reach over time.

Within Neptune Pass at the inlet, discharge is decreased by 44.5% – 60.6%, with the magnitude of changes decreasing with increased Mississippi River discharge. At lower discharges, the flow diverted through Neptune is controlled with its banks. At higher discharges, flow diverted through Neptune reaches capacity and overbank flow occurs, reducing the percent change produced by the structure.

There is an overall increase in flow through the neighboring Ostrica Pass. At lower flows this change is more significant, predicting an increase in discharge of nearly 25% under with project conditions. At higher flows, the magnitude of change is reduced to under 5% similar to the trend produced by overbank flow in Neptune Pass. Previous analyses of velocities and water surface elevations suggest that the change is due to an increased hydraulic connection between the Mississippi River and Ostrica and is not an indication of any formed connection between Neptune Pass and Ostrica under the control structure.





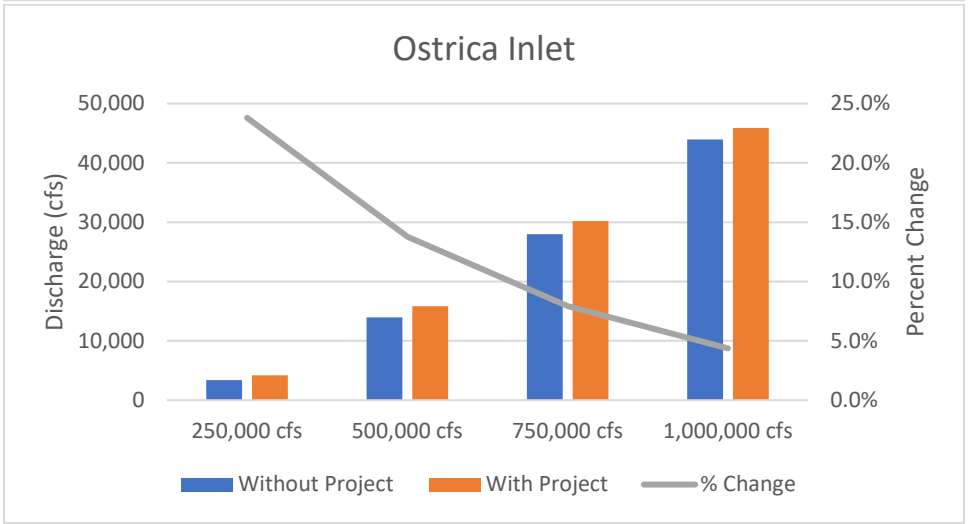


Figure 23. Changes in Discharges. The plots summarize a comparison of discharges with (orange) and without (blue) the recommended control structure at several important locations, including within the Mississippi River above Neptune Pass, within Neptune Pass at the scour hole, and within Ostrica Pass at the inlet.

Morphological Analysis

Long-term morphological change due to recommended control structure placement was evaluated by simulating a mobile bed model under an idealized Mississippi River hydrograph over 5 morphological years. Changes to bed elevation were permitted across the entire model domain, so enlargement of other passes and artifacts thereof also appear in model results. Under the current morphologic model parameterization, these results are only qualitative and are presented to show trends, not quantitatively predict land building or erosion.

Figure 24 presents a difference map of the cumulative erosion and sedimentation comparing with project conditions to without project conditions after 5 years. Map areas with positive values (green) represent increased sedimentation and/or decreased erosion under the recommended flow control solution. Map areas with negative values (orange/red) represent increased erosion and/or decreased sedimentation.

Patterns in the river show decreased shoaling at the inlet of Neptune and downstream. Shoaling within these areas has presented navigational issues that required dredging recently. Modeling results suggest that this issue should be somewhat alleviated. This finding is corroborated by the increased velocities within the river under structure placement.

There is increased deposition within Neptune Pass, especially near the upstream end. Decreased velocities through the pass under project conditions should allow for accumulation within deeper parts of the pass. There is also increased deposition within Bay Denesse due to the increased hydraulic connectivity with Neptune Pass.

There is increased erosion around the outlet of Ostrica due to the increased flow through the pass. There is also increased erosion in the gaps between SRED placement. These results are corroborated with the previous analyses.

Finally, there is decreased deposition further out Quarantine Bay and increased deposition directly behind SRED placement. This pattern suggests the sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound is now being trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh, the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time, as the deposited sediment becomes emergent, vegetates, and becomes established land.

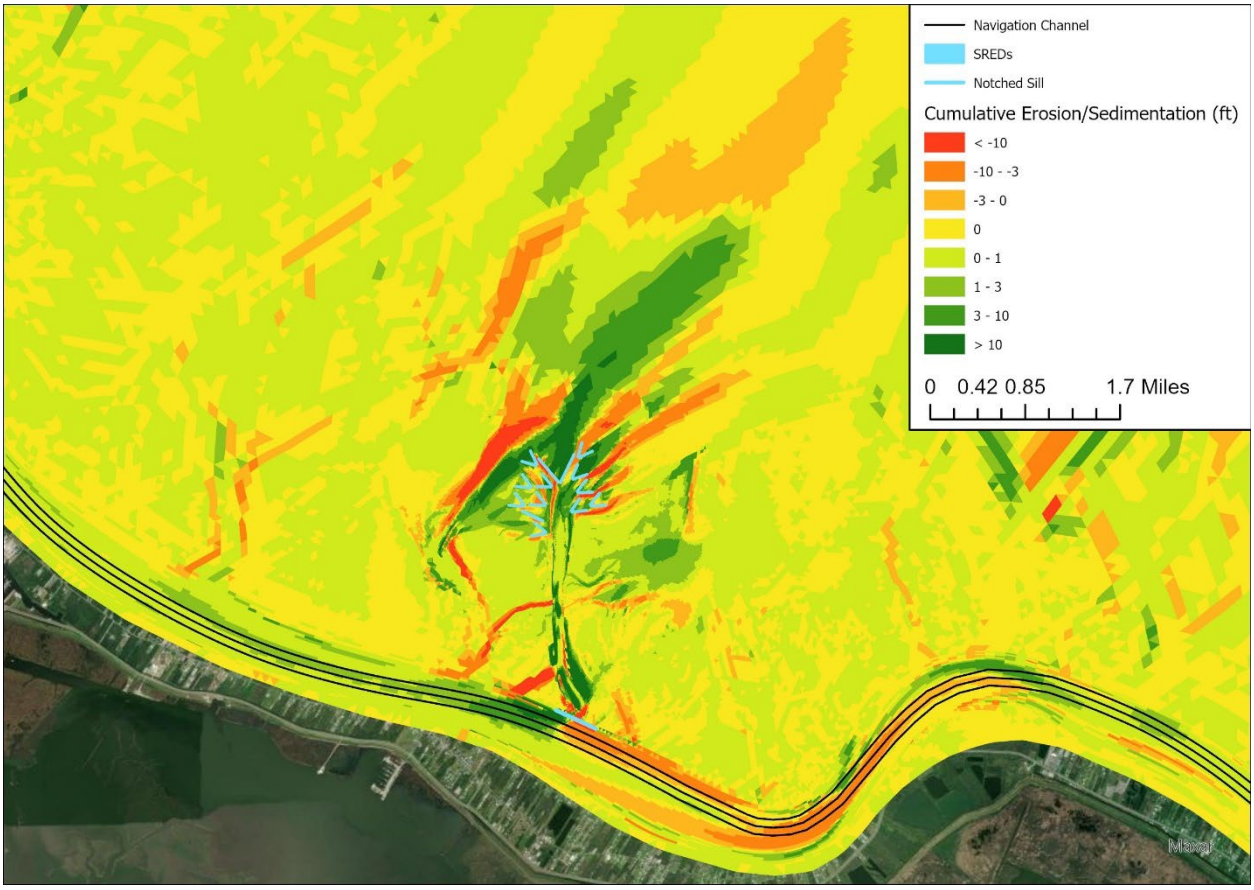


Figure 24. Comparison of Cumulative Erosion and Sedimentation. The difference map compares increased deposition and/or decreased erosion (green) and increased erosion and/or decreased sedimentation (orange/red) between the with and without project conditions after 5 years. Key takeaways include decreased shoaling in the Mississippi River downstream of Neptune, increased erosion through Ostrica, increased sedimentation throughout Neptune and Bay Denesse, and a shift of deposited sediment in the receiving bay nearer to Neptune Pass and surrounding marsh.

Conclusions

The complexity and dynamic nature of the marsh systems around the Lower Mississippi River requires detailed analyses be completed prior to introducing hydraulic changes to the system. Results from this study show that altering hydrodynamics through structure placement without proper analyses in this environment can cause deleterious and possibly irreparable damages to the system.

The ability for the pass to divert flow into the receiving basin, sediment rich or lean, is dictated by the available potential energy (head difference) at the site and conveyance capacity of the pass. Conveyance is partially reduced through placement of a stone structure in Neptune Pass, but its use is limited by the negative effects induced by larger structures, including high water surface elevation differences, increased flow through neighboring passes, and marsh erosion.

SRED placement in the backbay reduces the head difference between the river and backbay stage through a backwater effect, which, while significantly reduces the conveyance of Neptune Pass, leads to a more gradual spatial gradient in head loss. Most of this head loss would occur in the open water of the backbay and would not lead to scour of the existing marsh platform. Model calculations indicate that the placement of SREDs alone reduces the LMR discharge diverted through Neptune from 16% to

10%. Similar flow reduction through sill structure placement alone would require constructing the sill height to at least -3 ft NAVD88, significantly constricting the cross-sectional area of the channel and hindering small vessel trafficability.

The concentration of sediment in the diverted water does not instantaneously affect the ability of the structure to reduce flow but rather slowly reduces its capacity over time. Continued aggradation within the pass and backbay, induced by the chevrons, will progressively decrease the flow diversion capacity until eventual crevasse closure, essentially accelerating the natural evolution of a delta (Kleinhans et al, 2013). Optimizing the SWR of the sill structure allows design flow thresholds to be met while increasing the amount of sediment that can be diverted and advancing the natural delta-building processes.

Conversely, a full closure would leave the pass deprived of sediment, allowing factors such as sea level rise, erosional wave energy, and subsidence to further increase the head differences, leading to more frequent and more consequential crevasse formations along the lower Mississippi River east bank. The holistic approach of leveraging conveyance and energy potential energy factors offers a robust long-term solution instead of short-term repair.

Recent studies concerning the Mid-Barataria, Mid-Breton, and West Bay sediment diversions (Brown et al. 2019, Meselhe et al. 2012, Yuill et al. 2016) have analyzed the hydrodynamic and morphodynamic impacts of their implementation, and their findings corroborate those in this study of Neptune pass. The previous studies advocate for the use of a SWR to quantify and assess the morphological changes in both the river and receiving bay and confirm that sediment aggradation in the receiving bay creates a backwater effect which propagates upstream to the river, reducing the flux through the pass over time. Furthermore, recent data and analysis of the West Bay diversion support the use of strategically placed sediment retention enhancement devices (SREDs) as a technique to induce land building and accelerate basin filling in future diversions and crevasses (Henkel 2022).

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